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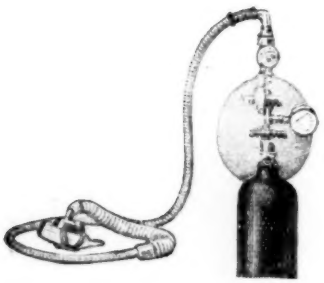

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GENTLEMEN,—Professor Arthur Keith, in his admirable address to this Society, relieved me of part of my proposed exposition by setting forth the views held by Hunter concerning the arteries, their contractility and living sensitive nature, and the call of the living tissues for blood which determines the circulation. I therefore propose to lay before you this evening those principles of the circulation which appear essential to me, and which are based on evidence published in a number of papers hitherto not summarised. Before so doing I venture to assume the powers of Prospero and summon the spirit of Hunter from the vasty deep to be present with us this evening and critically consider a line of research which, so far as conducted in the Hunterian method of inquiry, is homage to the master.

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I start with the measurement of the pressure of the brain against the skull wall, as shown in Fig. 1. *a* is a tube closed by a thin rubber membrane screwed into a trephine hole, *b* an air-bubble index, *d* a pressure bottle, *c* a manometer. The bulging brain presses the index out, it is restored to zero position by raising the pressure bottle, and the manometer records the required pressure. Trephining the lamina of the atlas, the same method gave me the pressure of the cerebro-spinal fluid. Trephining the torcular heropbili, a bony cavity, in the dog, the cerebral venous pressure was recorded. All three pressures were the same, all three indices showed similar cardiac pulsations and respiratory oscillations of pressure. In the morphinised dog, lying horizontal, the pressures were about 5–10 mm. Hg. If the belly were squeezed the three pressures rose together and equally, if the heart stopped they fell together to zero. The three pressures could be made to rise together by raising the pressure in the aorta or in the venæ cavæ. They could be raised by allowing normal saline to run into the cerebro-spinal cavity at a somewhat greater pressure. They signify that part of the arterial pressure which, left over after the resistance is overcome, expands the brain—i.e., the capillary-venous pressure.

The expansion of the cerebral arteries at each pulse helps to expel blood out of the brain into the venous sinuses, the inspiratory rise of arterial pressure also usually expands the brain, but the expiratory rise of venous pressure, if this be increased, may expand it more, as may be seen in the fontanelle of the crying infant.

Suppose a foreign body is introduced into the skull—e.g., a brass tube, with rubber bag attached, screwed into a trephine hole, and the bag blown out by a measured amount of water (a depressed fracture or blood extravasated from a meningeal artery acts in the same way), the bag expresses blood out of the surrounding brain, and the pressure in the obstructed vessels rises to the arterial pressure. The foreign body, blood clot, or depressed bone does not continue to press, but merely occupies room. It has ensanguined a part of the brain, and so raised the circulatory pressure in adjoining parts. Removal of the clot or bone is the remedy.

Consider next an inflamed area of the brain; the bacterial toxin causes dilation of the arteries, and there is increased imbibition of fluid by the poisoned tissues, the circulatory pressure rises then in the inflamed part, and the contiguous parts are pressed upon and partly exsanguined by the swollen part. So, too, in the case of a tumour; the fast-growing tumour with larger vessels swells at the expense of the other parts which become partly exsanguined.

Compensation for the room taken in the above ways may be brought about naturally by removal of tissue substance (by way of the circulation) out of the skull cavity. The skull is a rigid case, and its contents cannot vary so long as the skull is closed, but there may be more blood in the brain and less cerebro-spinal fluid or tissue substance, or on the other hand less blood and more fluid or tissue substance. The arteries may dilate and the tissue cells swell and confine the size of the veins so that there is a relatively rapid flow through the capillaries, or the arteries and cells may shrink and the veins dilate so that there is congestion with sluggish flow. But swelling and shrinking of tissue cells takes time. In the case of a rapid fall of circulatory pressure—i.e., if the heart be stopped—the brain does not shrink away from a glass window screwed into the skull, while it does shrink and empty of blood if air be admitted into the skull.

Given a normal level of arterial and vena cava pressures, the circulatory pressure in the brain is ruled by the swelling of the brain cells and by the secretion of cerebro-spinal fluid by the cells of the choroidal fringes, the degree of swelling and the volume of fluid together regulating the lumen of the veins, and so the capillary venous pressure. In a healthy state of activity the cerebral arteries are moderately expanded, the tissue cells in a normal state of turgescence, the veins narrow, the flow of blood and oxygenation good. In a state of collapse the opposite conditions hold, arterial pressure is low, veins congested, the blood flow slow, oxygenation poor. In the infant collapsed from diarrhœa the fontanelle is drawn in; it expands in the inverted position of the child.

EFFECT OF GRAVITY ON THE CIRCULATION.

Consider the model Fig. 2. *A* and *B* are the thin-walled rubber bags. The whole is affixed to a board, and the "heart" rhythmically pulsed and filled with water to a slight degree of distension while in the horizontal position. On placing the board vertical, *A* and the "heart" empty and *B* fills, owing to the hydrostatic pressure of the water and the expansile nature of the rubber bag. Give *A* a rigid case, make it non-collapsible, like the brain within the skull, the circulation in *A* will cease in the vertical position, if the "heart" does not fill, though *A* does not empty of blood. Squeeze *B* and the "heart" fills and the circulation begins again.

I took a grass-snake and fixed it lengthwise to a board, and exposed its heart and some inch of the vena cava below the heart. I put the board vertical with the head uppermost, the heart became empty

the blood standing at a lower level in the vena cava. I lowered the board, the heart filled, and the circulation began again. I put the board vertical once more and squeezed the body upwards, the heart filled; again I let go, and the heart emptied. Next, keeping the board vertical, I sank it in a bath of water, the hydrostatic pressure of the water outside balanced that of the blood within—not fully, because the skin resists the water, but enough for the heart to fill. I then put the board vertical with the head downwards, the heart filled, but the pericardium resisted over-distension, acting as the leather case does to a football bladder. I incised the pericardium, and the heart bulged through the opening. I removed the pericardium wholly, and the heart swelled greatly and could scarcely empty itself.

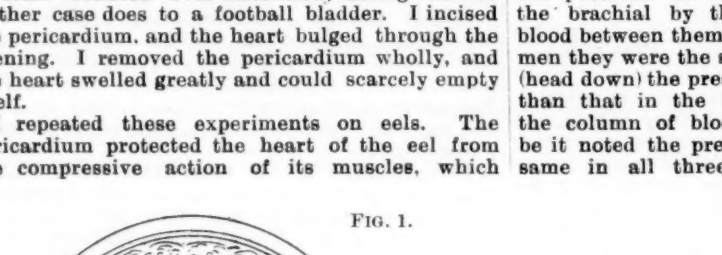
I repeated these experiments on eels. The pericardium protected the heart of the eel from the compressive action of its muscles, which otherwise produced over-distension when the animal struggled.

I took a hutch rabbit, a big-bellied one used to over-feeding and an indolent life; I fixed it to a board with head and limbs outstretched, and placed it in the vertical position with head uppermost. After a few minutes the ears and lips began to blanch, and in spite of expiratory struggles which temporarily restored the circulation, the heart ceased to fill, the cerebral circulation failed, the pupil became insensitive to light, the cornea to touch, and the breathing stopped. On restoring the animal to the horizontal position consciousness returned again. If while in the vertical posture the belly were squeezed, consciousness was equally restored. So, too, if the animal were sunk in a bath. In the vertical posture the heart was found to be empty, the blood standing in the vena cava at a level below the heart, the vena cava drawn taut by the viscera hanging on it. On compressing the belly the blood could be watched filling the vena cava inferior and right side of the heart. Repeating the experiment on a wild rabbit with firm belly wall, nothing happened; the heart did not empty, the cerebral circulation continued.

In the cat or dog the carotid blood pressure is well maintained in the vertical position, but poisoning with chloroform, or division of the spinal cord in the upper thoracic region, brings about a great fall by weakening the vaso-motor control and the support of the abdominal muscles.

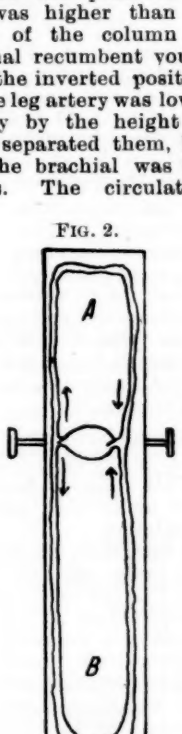
The invention by the late Harold Barnard and myself[1] of the armlet for blood-pressure measurement enabled me to measure the influence of gravity on the circulation in man. I found that in the standing posture the pressure in the posterior tibial artery was higher than in the brachial by the height of the column of blood between them. In normal recumbent young men they were the same. In the inverted position (head down) the pressure in the leg artery was lower than that in the arm artery by the height of the column of blood which separated them, but be it noted the pressure in the brachial was the same in all three postures. The circulatory mechanism is so contrived as to keep the blood pressure constant in the ascending aorta, while that in the legs varies with posture very widely. Engaged in this mechanism are afferent nerves, which supply the mouths of the venæ cavæ and the root of the aorta and reflexly control the frequency of the heart and the contraction of the arteries. The tone of the belly muscles and the respiratory pump is also influenced reflexly by the weight of the organs acting on afferent nerve endings and by the flow of blood through the nerve centres and oxygenation of these. In the case of a convalescent, from an exhausting disease, rising from bed for the first time the tone of the belly wall is lacking, the blood sinks down, the heart accelerates, the patient feels faint, or may actually faint. A faint is abolished by laying the man horizontal, or forcing him to bend and squeeze his belly against his thighs, or by strapping up his belly. Not only does the pulse quicken in the unfit, but the blood pressure falls when he stands up. There is a great difference between his systolic and diastolic pressures. His pulse, too, is greatly

FIG. 1.



Schema of experiment designed to measure the pressure of the brain. At (1) the gauge is applied through a trephine hole in the skull-wall, at (2) through the lamina of the atlas, at (3) in the torcular herophili. A = artery, V = vein. (For other lettering see text).

FIG. 2.



Model to show the effect of gravity on the circulation.

[1] An invention made independently and at the same time as that of Riva Rocci.

accelerated and may be made irregular by exercise. His vital capacity, also, as Martin Flack has shown in the case of unfit pilots, is greatly reduced, and he cannot hold his breath for long or blow hard against a column of mercury.

THE EFFECT OF EXERCISE ON CIRCULATION.

Those suffering from cardio-vascular debility, people convalescing from illness, or falling ill, those exhausted by war or flight-strain, alike fail in these tests. Flack has developed for flight cadets exercises designed to strengthen the expiratory power of the abdominal muscles, and made a most valuable application of the lessons learned from Fig. 3, taken from my second paper on Gravity and the Circulation, in which Barnard coöperated. It shows the brain enclosed in a rigid wall, the thoracic organs in a wall which enlarges by the action of the diaphragm in inspiration and so sucks in both air and blood into the thorax, and contracts in expiration, and so squeezes out of the thorax both air and blood. The belly organs are compressed by the descent of the diaphragm and enclosed in a muscular wall, which can be relaxed so as to admit food and drink and more blood, or contracted so as to expel the fæces or urine or drive out blood. The heart is shown enclosed in a pericardium,[1] which prevents its over-expansion, so that the contracting belly wall can squeeze blood through the right heart into the lungs, the entrance into and the escape of air out of the lungs being suitably controlled by the glottis. The diagram also shows the limbs encased in skin, so that every movement of the muscles and change of posture drives blood from capillaries and veins past the valves in the veins towards the heart. Clench the fist and one sees the blanching of the vessels on the back of the hand; lower the hand, they congest; raise it, they blanch. Hunter pointed out that dependance of a part and immobility produce œdema and delay healing by impeding the circulation, and that congestion produced by gravitation increases the pain felt in inflamed joints. The vessels in the body are arranged so that every muscular movement drives capillary and venous blood onwards. The peristalsis of the intestine not only moves to and fro, or sends onward, the chyme, but expels the blood out of the capillaries and the chyle out of the lacteals. The rhythmic contraction of the spleen converts this into a blood pump; similarly other organs are either squeezed by their own muscular coat, or squeezed as the liver is squeezed between the diaphragm and the muscles of the abdominal wall. In walking, still more in running, the deep breathing and movement of the muscles rhythmically express blood from the organs and venous reservoirs of the belly into the right heart, and through the right heart into the lungs, which are widely expanded in inspiration to receive it. The respiratory pump massages the belly organs and effectively aids the circulation. Vigorous exercise ventilates the lung, five, even ten times more, and sends the blood swirling in well-oxygenated streams through all parts, uses up the food that is eaten for the production of energy, and so ensures a clean bowel, good appetite, and well-nourished organs. The cooling power of the wind stimulates us to exercise in the open air to keep warm, and greatly enhances the value of the exercise.

Exercise in the open air and sea-bathing afford then the successful treatment for cardio-vascular debility. The sedentary life of the scholar, the sempstress, or the light hand worker in factories must be balanced by open-air exercise, facilites for which can only be secured by the rebuilding of tenement dwellings as garden cities, and the establishment of playing-fields and gardens. Be it noted that the gardens also afford the means of cultivating green vegetables and thus the securing of essential vitamines which the tenement dweller lacks.

THE RESILIENCE OF ARTERIES.

The arterial pressure in the femoral artery in cases of aortic regurgitation is much higher —e.g., 100 mm. Hg or so—than in the brachial artery with the patient lying horizontal. There is, too, a wide difference between systolic and diastolic pressures in these cases. I found that the pressure might be made higher in the femoral artery in healthy young men by making them run up and down stairs several times, so inducing a forcible heart beat; also that the difference in cases of aortic incompetence might be made less or even abolished by placing the buttocks in a bath of hot water. In healthy resting young men a difference might be detected between the right and left arm after their placing one in hot and the other in iced water. The iced upper arm might give a lower reading than the heated forearm.

If the wall of an artery is contracted and more rigid it conducts the crest of the pulse-wave much better than if the wall is soft and slack. In the latter case the crest of the pulse-wave spends its force in distending the wall of the artery.

On a model constructed by Russell Wells it was shown that the thinner a rubber tube the more it is stretched by the pulse-wave, the more is its resilience brought into action, and the less well is the crest of the systolic wave conducted, and the nearer together are the diastolic and systolic pressures at the peripheral end. A pump systolic pressure of 160 and diastolic 40 mm. Hg. gave, in a rubber tube 0·8 mm. thick, a sphygmogram showing great amplitude, sharp rise and fall, well-marked dicrotic waves; in a tube 0·2 mm. thick a slow rise, flat top, slow fall, slight dicrotic waves. In accordance with the contraction and rigidity of the arterial wall, the same heart beat delivers to the capillary-sized vessels hammer-like percussion waves, beating them open, or a more continuous but lower pressure of blood. In renal disease I think it is the cells, strangled by inflammatory processes, which call for the hammer stroke. Hence the high systolic pressure. The danger of cerebral hæmorrhage arises not from the high pressure, but from vascular degeneration set up by the abnormal metabolic conditions.

THE MEASUREMENT OF BLOOD PRESSURE.

I now ask you to consider what happens when, in measuring blood pressure, the arm is compressed by the armlet. On raising the pressure the veins and capillaries in the part of the arm confined by the armlet are first compressed and the flow obstructed, the pressure rising in these vessels up to arterial pressure; the main artery is thus kept full and cannot be flattened until the pressure in the other vessels is over-topped. When the diastolic pressure is just over-topped the artery is flattened in diastole and swings into full round shape in systole, the pulse then giving its maximal excursion. The auditory method also gives an index, for when the pressure is raised above, and then allowed to fall just below what is required

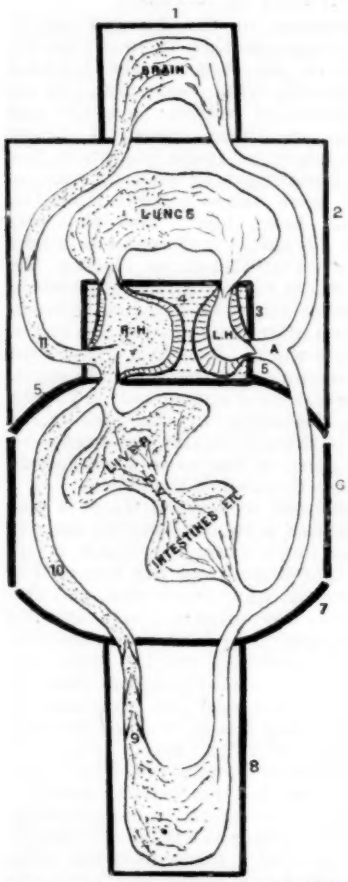
[1] The diagram shows shows how a pericardial effusion obstructs the filling of the heart.

to flatten the artery in diastole, the noise (heard over the artery below the armlet) suddenly becomes quiet. Be it noted the maximal oscillation is just as true an indication of diastolic pressure as the auditory change of sound..

When the bag of my pocket sphygmomanometer (Fig. 4) is pressed upon the wrist over the radial it acts in the same way as the armlet, and the gauge gives the same readings of systolic pressure as the armlet sphygmomanometer. But in the pulse-wave expends its force on dilating the artery above the chink, and does not pass through. This is why an arm with tissue vessels constricted by ice gives a lower reading than one with tissue vessels dilated by hot water.[2]

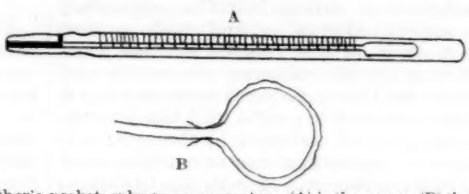
The facts may be largely demonstrated by a model. Fig. 5 shows a chamber containing two pieces of human carotid; water circulates through these with a pulsatile flow. Owing to frictional resistance there is a lower pressure in the distal

FIG. 3.



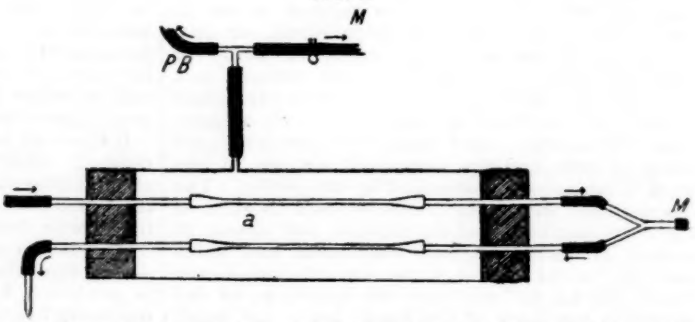
Schema of the circulation of the blood in man in the erect position. 1, Skull. 2, Thoracic wall. 3, Fibrous pericardium. 4, Pericardial effusion. 5, Diaphragm. 6, Oblique and transverse muscles. 7, Levator ani. 8, Skin and muscles of the legs. 9, Femoral vein and valves. 10, Inferior vena cava. 11, Superior vena cava. R.H., Right heart. L.H., Left heart. A., Aorta. P.V., Portal vein.

FIG. 4.



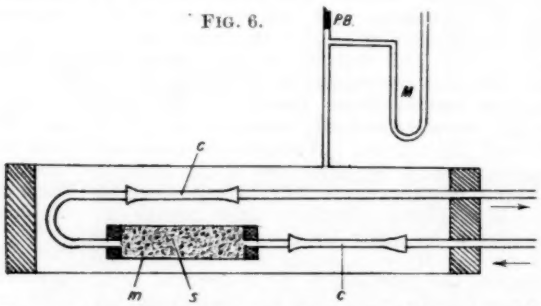
The author's pocket sphygmomanometer: (A) is the gauge, (B) the bag to press over the radial artery. (Made by Hicks, 8, Hatton Garden, E.C.)

FIG. 5.



Chamber containing two pieces of human carotid artery (*a*) through which water is made to circulate. Owing to friction the pressure is lower in the distal piece. M = manometer. PB = pressure bottle.

FIG. 6.



The same chamber as in Fig. 5, containing pieces of human carotid artery (*c*), with the addition of a thin rubber bag enclosed in muslin (*m*) and filled with chopped rubber sponge (*s*) to simulate the tissue capillaries.

case of an aberrant radial observed by James McQueen, as also in the dorsalis pedis (or temporal) artery, where it lies upon bone unsupported by tissues full of veins and capillaries, the bag gave a far lower systolic pressure. The pressure in the carotid artery in the dog measured on one side with the bag was the same as that on the other side measured directly by means of a cannula and a manometer. When, however, the carotid was exposed and placed on a flat piece of wood a far lower pressure of the bag sufficed to stop the pulse. The conclusion was reached that an artery, unsupported during compression by surrounding tissue vessels, is easily distorted from the round into a chink-like shape, and then the piece. On compression this flattens first. When a single piece of artery is used the pressure required to distort its distal end and stop the pulse-wave passing is much lower than the pressure required to stop water trickling through.

Arranged as in Fig. 6, the flow is first through the artery, then through tissue capillaries, then through the vein. The tissue capillaries are formed of chopped rubber sponge enclosed in a thin rubber bag, and this in its turn enclosed in muslin to limit its expansion. The vein first flattens on compression and the tissue capillaries shrink (the

[2] Martin Flack and James McQueen coöperated in these researches.

pulsing artery expels fluid from these). The system then becomes more rigid, the pressure rising to arterial pressure all through it; next the artery flattens in diastole and finally in systole.

MEASUREMENT OF CAPILLARY PRESSURE.

Roy and Graham Brown, observing under the microscope the capillary vessels in the mesentery, by means of a transparent bag squeezed them against a glass slide. It required very little pressure to begin to affect the flow. To stop it the pressure in the arterioles must be overcome. The capillaries do not alter in width when the circulation is stopped; they are not elastic tubes merely controlled by the arterial pressure. On the other hand, they may spontaneously alter in width under the influence of irritation or tissue activity.

The normal capillary pressure cannot be measured in man by the method of blanching the skin (Fig. 7): firstly, because the skin resists distortion; secondly, because the observation requires

FIG. 7.

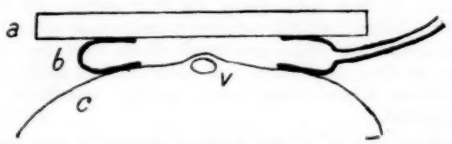
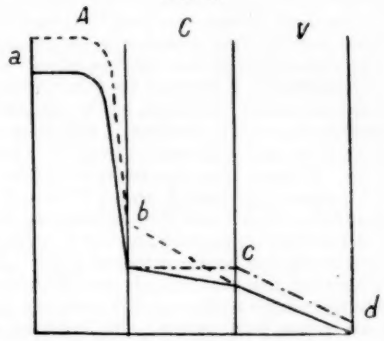


Diagram of measurement of normal venous and capillary pressure by the method of blanching the skin. *a*, Glass slide. *b*, Rubber bag with a hole punched through the middle. *c*, Arm. *v*, Vein.

immobilisation of the part and the capillary-venous circulation is affected by every muscular movement and change of posture; thirdly, blanching signifies the shutting up of arterioles, not capillaries. I have endeavoured to measure the capillary pressure by inserting a hollow needle under the skin connected with a tube containing sterile water and an air-bubble index, and finding what pressure it takes to drive the index inwards. The pain produced by the entering droplet of water is also an index. Using this method one finds a very slight pressure suffices either for the arm or the leg, not only in the horizontal position but in the vertical posture. The capillaries do not share then in the hydrostatic difference of pressure shown by the arteries. If we hang down a hand and keep it immobile we soon cannot bear the ache produced by the capillaries congesting under the influence of gravity; naturally we shift the position of the part and empty the capillaries on into the veins. When an armlet is put round the upper arm and the pressure raised and kept just below systolic pressure the veins are obstructed, the capillaries fill, the hand swells, and the ache grows. If one then measures the pressure required to flatten the veins on the forearm, one finds the pressure has risen up to what it is in the armlet. (A proof that the armlet method reads the systolic pressure truly.) When the pressure in the main veins has risen considerably, it is still possible to express blood out of the capillaries and veins on the back of the hand by clenching the fist. It is generally assumed that if arterial and venous pressure are both raised capillary pressure must be raised, but we see by the action of the muscles and the valves in the veins it is possible to have a high pressure in both arteries and veins of a part, and no pressure in the capillaries until they once more fill.

The vascular system is then not a continuous one like the models constructed to represent it. When the heart is stopped there is no uniform residual pressure; on the contrary, blood sinks into the lower parts, and upper parts empty and collapse. When the arterial pressure is raised by the constriction of arteries the rise is due wholly to increase of frictional resistance therein, none of it is due to reduction in the total capacity of the vascular system. We know that at any one time

FIG. 8.



Graph unsupported by evidence but given in text-books as showing the fall in blood pressure from the artery (*A*), through the capillary (*C*), to the vein (*V*), and the effect of raising arterial pressure (interrupted line) and venous pressure (dot and dash line).

normally a vast number of the capillaries are empty. Krogh has recently brought fresh proof that this is so. Cold shrinks up the cutaneous capillaries, heat fills them; a vast difference pertains between the two conditions. The respiratory movements, the intestinal contractions, the movements of the skeletal muscles are all designed to squeeze the blood from the capillaries and keep a very low pressure within them.

The regulation of the circulation (1) by the cardiac nerves afferent and efferent (acceleratory and inhibitory); (2) by the vaso-motor nerves (constrictor and dilator); (3) by the compressive or expansive action of the voluntary, respiratory, and visceral muscles; (4) by change of posture and action of gravity is designed so as to keep steady the composition of the blood and fluid bathing the tissues. Thus during exercise the circulation is increased proportionately with the consumption of oxygen and production of carbon dioxide, and breathlessness in heart cases is the test of circulatory fitness and the capacity to take exercise.

The study of the immobile animal and of models leads away from the true conception of the mechanism. The circulation could not continue for a moment if all the blood-vessels, arteries, veins, and capillaries were freed from the support of the surrounding tissues and membranes which confine the tissues. These form a support to the vessels which is of no less importance than their own wall. The body requires to be kept hard in a lean and wiry state, with no excess of fat or tissue fluid, and no wind in the guts—a state in which the tissues, muscular and glandular, confined within their membranæ propriæ and capsules are maintained in turgescence, thus supporting the blood-vessels, whose coats have good tone, the whole confined in a firm cool skin.

THE CAPILLARY PRESSURE AND THE PATHOLOGY OF ŒDEMA.

Although there is no evidence of a higher pressure in the capillaries than in the tissue fluids, this is

generally assumed, and it is supposed that filtration takes place from the capillaries—e.g., in the case of the renal glomeruli, formation of lymph, aqueous fluid, &c.—and that œdema is produced by increased capillary pressure and filtration. My view is that the tissue cells and fluid enclosed by capsules and skin exactly counterbalance any pressure there is in the capillaries, and that the cellular force of imbibition draws fluid out of the capillaries.

C. Bolton has shown that after obstructing the flow in the vena cava inferior, by narrowing it down by three-fifths, the venous pressure is only temporarily and slightly raised, and that œdema occurs after the venous pressure has returned to the normal level. Œdema is not due to filtration, but to obstruction of the flow of blood, leading to want of oxygen and metabolic changes in the cells, which result in increased imbibition. I found in a case of hydrocephalus that the fluid pressure equalled about 20 cm. of water. On raising the head from the pillow the pressure did not fall owing to gravity, but rose owing to my hands squeezing the head—a bag of fluid. It is not conceivable that the pial vessels could support any part of this pressure; the capillary venous pressure must have risen pari passu. On drawing off the fluid the pressure sank to atmospheric pressure and the soft wall of the skull by its weight sagged in. So it remained for hours, until, as the fluid was secreted, the pressure gradually returned. In a case of œdema of the leg I found the pressure equalled about 50 cm. of water, the patient was sitting up in bed; here, again, the pressure did not fall, but rose on lifting the leg up owing to squeezing of the leg by the hands. The capillary-venous pressure must have been the same as the fluid pressure.

We must bear in mind that the capillaries are evolved out of intracellular spaces, such as are found, for example, in a Turbellarian worm, in which a sort of circulation is kept up by movements of the animal's body. Pulsatile channels were next added, and finally hearts.

I have recently tried to get some measure of the normal capillary pressure by microscopic examination of the frog's web, mesentery, and tongue, after stopping the arterial flow (1) by ligature, (2) by excising the heart, (3) by cutting off the part—in this case the foot. The capillary circulation continues for several seconds, gradually becoming slower and finally stopping in most of the vessels. On exploring the field, however, there may be found one or more vessels—e.g., an arteriole with connecting capillaries and a venule—in which the flow continues for some minutes at a speed which is no less than the normal speed in the capillaries. The flow after a time may reverse. A slight movement of the limb may hasten the flow, reverse it, or may start a flow. Thus the replacing the frog's web under the microscope, 40 minutes after cutting off the leg, started a flow which lasted for some minutes. It seems clear to me, then, that the very slightest difference of pressure suffices to maintain the capillary flow. The fact that the flow reverses is against its being caused by any contraction of the larger arteries. So, too, is the fact that a slight movement of the amputated leg hastens the flow in the web of the foot. A search in the Royal College of Surgeons Library revealed that a French physiologist, Guillot, in 1823 made similar observations and found the heat of a candle accelerated the flow. I find a momentary exposure of the frog's web to the heat of a fire both starts and accelerates the flow. I would call to mind here the very remarkable flow in the so-called veins of the slime fungus or myxomycetes, which rhythmically reverses—first a rushing stream of granules towards the growing edge, then a stream away from the edge. The capillary flow seen in the excised foot of the frog is due, I think, either to evaporation or to blood sinking down into some dependent, or more flaccid, part.

The contraction and expansion of capillary-sized vessels has been demonstrated by many; recently by T. Lewis and his co-workers in the skin, and in the frog by Krogh. On irritation of a part local hyperæmia is brought about through the afferent nerve fibres—by "axon reflex." There is evidence that the metabolic state of tissue cells governs the flow, and I would urge that it is not the capillary wall but the swelling or shrinking of the tissue cells, and in particular of muscle, voluntary and involuntary, which controls the width of the capillaries.

The body may lose 7 lb. of water by sweating during hard exercise in hot weather. The tissues shrink and keep up the supply of water in the blood, which scarcely becomes more concentrated; the muscles must then increase their tone so that the skin and membranes confine the shrunken tissues and keep up the hardness of a fit person.

THE INFLUENCE OF MEMBRANÆ PROPRIÆ AND OTHER MEMBRANES ON THE CIRCULATION AND SECRETORY PRESSURE.

In the case of the salivary gland there is a strong membrana propria which confines the secreting cells of each alveolus, comparable to the sarcolemma of a muscle fibre or neurilemma of a nerve fibre. It limits the expansion of the alveolus, acting like the leather case of a football, the pericardium of the heart, or the connective tissue coat of a blood-vessel. Each lobule, each lobe, and the whole gland is surrounded with membranes limiting expansion. When the secretion is obstructed the alveoli swell, the lobules and lobes swell, and the whole gland swells until limited by the membranes, and the veins within the gland are compressed and diminished in volume, while the arteries dilate and the circulatory pressure is thus raised until arteries, capillaries, and veins approximate to a rigid system at arterial pressure with a fast rate of flow. As the membranæ propriæ, &c., limit the expansion of the alveoli, the veins are not shut up even when the duct is obstructed, and the secretory pressure rises much above the arterial pressure. Flack and I observed in one case that with 240 mm. Hg in the salivary duct and 130 mm. Hg in the carotid artery 27 drops flowed out of the salivary vein in 20 seconds. In the sweat glands the structure is similar to that in the salivary glands, and the same high secretory pressure may be produced.

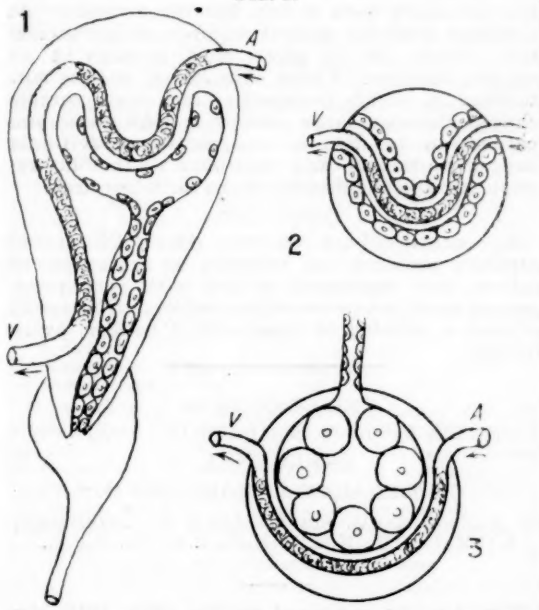
It is a fundamental principle in the construction of the body that the cells are enclosed by membranes which permit imbibition of fluid but check swelling, thus enabling them to do work and at the same time receive an ample supply of blood.

In the kidney there are membranæ propriæ enclosing the secreting cells of both renal capsules and tubules. The secretory pressure, however, does not rise up to the arterial pressure (133 mm. Hg carotid artery and 88 mm. Hg in the obstructed ureter—Starling). In the case of the kidney the bladder acts as a reservoir and the abdominal wall keeps off external pressure.

The structure of the kidney does not support the doctrine that fluid is filtered from the blood into the capsule of the glomeruli by the blood pressure. The glomerulus is a lobule of a gland secreting within a capsule. In worms the glomeruli hang in a blood space; filtration pressure cannot exist.

Obstruction of the ureter does not at first diminish, but increases the secretion of urine

FIG. 9.



Schematic figure of secreting cells, membrana propria, capillaries and capsule of: 1. Kidney. 2. Eye. 3. Salivary gland. A = artery. V = vein. From Flack and Hill's Text-book of Physiology (Arnold).

(Cushny). The whole gland then becomes tense and the blood flow rapid through a system of vessels approximating to a rigid system. Each pulse expels blood out of the veins and urine out of the collecting tubules.

INTRA-OCULAR PRESSURE.

Now let us turn to some observations made on the eye, in which Flack coöperated. The pressure of the aqueous fluid was measured by a hollow needle thrust through the cornea connected with a tube containing an air-bubble index, and this in its turn with a pressure bottle and manometer. The pressure (20 mm. Hg or so) varies, as is well known, with the arterial pressure. That the pressure of the aqueous balances the capillary venous pressure in the iris is shown by the fact that on letting the fluid escape the iris bulges forward and may touch the cornea, and on compressing the abdomen the vessels of the iris burst; and blood comes into the anterior chamber. No such bulging or hæmorrhage can be brought about by squeezing the belly when the eye is intact.

One of the venæ vorticæ was opened and the venous outflow observed, while the pressure in the eyeball was raised by forcing normal saline into the aqueous chamber; the outflow of the venous blood did not cease until the pressure in the carotid artery was just overtopped, showing that the capillary venous pressure rises together and equally with the fluid pressure within the eyeball, just as within the cerebro-spinal cavity.

The contents of the eyeball are confined by the corneal membrane of Descemet and the glassy membrane of the choroid, supported by the cornea and sclera, and the intra-ocular pressure is ruled by the secretory action of the cells of the ciliary processes. If the cells secrete more aqueous there is less room for blood, the veins narrow, and the capillary-venous pressure rises. If the arterial pressure increase the capillary-venous pressure this increase is instantly transmitted to and balanced by the aqueous. The pulse causes a rhythmic expansion and shrinkage which keeps up the flow of blood and fluid.

Accommodation is established by a perfectly balanced transference of fluid from the front to the circumferential region of the lens; this transference, brought about by the ciliary muscle, causing the lens to become more convex.

The spaces of Fontana are covered by a layer of endothelium less than 1μ thick, and supported as this is by an equality of pressure, aqueous on one side, venous blood on the other, the normal absorption of aqueous takes place.[8] In the bloodless eye of the dead animal the spaces are converted into filtering structures on forcing fluid into the aqueous chamber. So, in the dead kidney, on driving water through the renal vessels it filters out through the dead collecting tubules, carrying with it degeneration products of the cells.

Abrading the skin, opening the eyeball or skull cavity in the living animal, removes in each case the balancing counter-pressure, and allows plasma to escape through the capillaries which are no longer supported. The cells and capillary wall, too, are damaged by exposure, and this enhances the outflow of fluid.

The Effect of Inflammation on the Circulation.

In acute glaucoma there are disordered metabolism and increased imbibition, while the pathways of absorption may be obstructed, for example, by dilatation of the iris. The increase of fluid lessens the volume of the veins and so raises intra-ocular tension. The surgeon's knife relieves glaucoma by allowing the outflow of fluid and inflow of blood, with its immunising properties, as in any other inflamed part.

The tissue cells in the skin are confined by frameworks of connective tissue which limit expansion and act as the membranæ propriæ of a gland. In states of inflammation the tissue cells swell, the arteries dilate and the pressure rises as the swollen tissues press upon and narrow the veins. The vessels approximate to a rigid system, hence the high tension and pulsatile-throb of the inflamed part. The flow from the veins witnessed in the old days of bleeding was two or three times greater in an inflamed arm. Finally stasis may be produced by exudation of plasma from the damaged capillaries. The surgeon's knife by cutting, the hot fomentation by softening, relieve tension and allow increased flow of blood and lymph to the part.

SOME REMARKS ON SHOCK.

I finally ask you to consider the condition of shock which may arise from intense nervous excitation; from absorption into the blood of toxic products probably of protein origin arising from traumatised tissues; from absorption of bacterial toxins and certain other poisons; from exposure to excessive heat; from hæmorrhage; from want of oxygen in the air breathed. When traumatic shock is well established no relief can be given by any measures taken to confine the capillaries—e.g., by bandaging the limbs. The blood is not only pooled within them, but fluid has transuded out.

[8] Ehrlich's study of aqueous secretion by the injection of fluorescin supports these views.

Crile upheld the view that traumatic shock is due to exhaustion of brain cells by intense sensory excitation, and that such could be prevented by local anæsthesia which blocked the sensory nerves. By suitable anastomoses of blood-vessels he cross-circulated two dogs, so that the blood of each intermingled; only the animal submitted to traumatism showed the characteristic changes in the brain cells. These were produced then not by products of traumatism in the blood but by sensory excitation. Severe traumatism of the brain itself did not produce the changes in the brain cells. No shock was produced in spinal animals by traumatism of the body below the point of section of the spinal cord. Similar changes in the brain cells were produced by fear, exhaustion through excessive activity, prevention of sleep, great loss of blood.

The sub committee of the Medical Research Committee on Shock has brought forward evidence which favours the view that shock can be brought about by absorption of a substance or substances from killed and dying tissues; thus amputation of a limb may relieve shock by putting an end to such absorption. So, too, in the case of extensive burns of the skin, shock is regarded as resulting from absorption of products of protein decomposition. Local trauma—a burn or the wheal of a cane—causes capillary flushing and œdema provoked by damaged tissue products. Noteworthy is the observation by Dale that an etherised cat can be put into the condition of shock by an injection of histamine, but not the normal cat nor one anæsthetised with nitrous oxide and oxygen. On the one hand there is the cumulative effect of two poisons, on the other the protective effect of oxygen. In the state of shock produced by the injection of histamine in the etherised cat the whole of the potentially available capillary channels become patent, the blood percolates into the network of channels as a sponge. 50 to 60 per cent. of the plasma may pass out. A constriction of the arterioles holds up the arterial pressure, but the venæ cavæ are flaccid, half empty, the portal vein flat, the filling of the heart in diastole wanes. The liver and spleen are moderately pale, but the bowels show a diffuse dusky congestion.

Shock due to Increased Imbibition.

It seems to me that shock is due to metabolic products opening up all the capillaries and increasing imbibition in all the cells of the body at the same time; such products can be evoked in the cells by violent nervous stimulation, by want of oxygen or by toxic substances in the blood. Waller finds in people of nervous temperament that the electrical resistance of the current passing between the back and palm of the hand is lowered by emotional changes of consciousness. This is probably an index of the change brought about in the imbibition forces of the cell by nervous shock. The concentration of ions on the cellular membranes and imbibition of fluid by the cells are so changed in shock, that a generalised passage of fluid into extracellular spaces and flaccidity result, with pooling of the blood in dependent parts; the consequent failure of the circulation and oxygen supply intensifies the evil.

The quick breathing set up in shock by cerebral anæmia and want of oxygen washes CO_2 out of such of the blood as continues to circulate and increases the alkalinity of the tissues which receive it—e.g., heart and brain—for the alkali, whic was bound to CO_2 in the blood, is taken up by the tissues when set free. There is, then, an alkalosis and not an acidosis in shock, and the injection of sodium bicarbonate is contra-indicated. (B. Moore.) The alkalosis lessens the sensitivity of the respiratory centre, and thus air containing 2 per cent. of CO_2 acts as a stimulant and secures better oxygenation of the blood.

Injection of Bayliss's gum saline is required to fill up the blood-vessels; the colloid gum retains the necessary salts within the blood-vessels. At the same time the patient requires oxygen inhalation, which can be given most suitably in an oxygen chamber. I have constructed, and am now testing, a light, collapsible, and transportable oxygen chamber, large enough to take nurse and patient, to be used in conjunction with liquid oxygen containers, and ventilated so that no recirculation or purification of the air is required.

CONCLUSION.

In conclusion I ask you to consider not increased capillary pressure and filtration as the causes of œdema, but stagnation of flow with consequent oxygen want and increased imbibition. The result of such a shifting of ideas will, I believe, prove fruitful.

THE RESULTS OF PROTECTIVE INOCULATION AGAINST INFLUENZA IN THE ARMY AT HOME, 1918–19.

BY MAJOR-GENERAL SIR WILLIAM B. LEISHMAN, K.C.M.G., C.B., K.H.P., M.B., F.R.C.P., F.R.S.,
DIRECTOR OF PATHOLOGY, WAR OFFICE.

THE LANCET published on Oct. 26th, 1918, the proceedings of a Conference of bacteriologists, summoned by the Director-General of the Army Medical Service to consider the advisability of employing in the army a preventive vaccine against influenza. This Conference, of which I had the honour to be chairman, agreed that such a vaccine might be expected to be of service, and made recommendations as to its constitution and use. The vaccine recommended was accordingly prepared at the Royal Army Medical College, and, in certain commands, used on a considerable scale.

In view of the opinion, widely expressed in both medical and lay journals, that we are threatened with another epidemic wave of influenza, it is felt that the results obtained in the army commands at home last winter with the vaccine in question should be made known, not only because it is proposed to advocate its employment again in the army, if we should be so unfortunate as to find ourselves in the presence of a serious recrudescence of the disease, but also because the modified vaccine now in army use has, I understand, been adopted by the Ministry of Health for employment in the civil community.

The Original Formula.

The vaccine formula recommended by the Conference mentioned above was as follows:—

B. influenzæ	60 millions	in 1 c.cm.
Streptococci	80 ,,	
Pneumococci	200 ,,	

Several strains and types of each organism were used, all comparatively freshly isolated from cases of the disease. Two doses were recommended, the first 0·5 c.cm., and the second, given after 10 days' interval, 1 c.cm. The statistical results recorded below apply solely to the vaccine prepared in accordance with the above formula.

As was naturally to be expected, in view of the divergent views held as to the bacteriology of the epidemic, the proposed constitution of the vaccine was subjected to a certain amount of criticism in subsequent issues of the medical press, and the points made in these communications, many of them most valuable and helpful, were duly noted. One of the principal criticisms was concerned with the dosage which had been agreed on as appropriate for the *B. influenzæ* moiety of the vaccine, it being urged that a considerably larger dose of this might be given with safety and with the prospect of an enhanced degree of immunity. In view of this, and also of the fact that, as the bacteriological experience of the epidemic extended, the ætiological rôle of Pfeiffer's bacillus came more and more into prominence, I consulted my colleagues of the original Conference afresh upon this point and found them all in agreement with an increased dose of Pfeiffer's bacillus, which I proposed should be raised from 60 millions to 400 millions in 1 c.cm., it being understood that the strains employed should not have been so cultivated or so recently derived from cases as to be unduly toxic in their action.

The Revised Formula.

The formula of the vaccine as thus revised, and as now employed in the army, is therefore:—

B. influenzæ	400 millions	in 1 c.cm.
Streptococci	80 ,,	
Pneumococci	200 ,,	

From the first it was desired that every attempt should be made to secure clear statistical evidence of the results of the inoculations with the vaccine, and the necessary instructions to this effect were circulated by the War Office, returns in accordance with a simple *pro forma* being called for at regular intervals. In theory such clear evidence should have been easy to collect through the workings of official machinery; in practice it has been very difficult. Only those familiar with the strain thrown on the medical personnel by the addition of a severe and widespread epidemic to the already sufficiently arduous labours of those days of urgent and wholesale demobilisation can appreciate the difficulties of collecting and recording, in accurate detail, the information required for the returns. In spite of these difficulties, which, unfortunately, vitiated some of the returns, a considerable number of inoculations were carried out, and the records were received and analysed at the War Office.

Although it is very far from my intention to make any claim that the figures presented below are conclusive and free from all or even, in some cases, from possibly large fallacies, they serve, I think, to show at least the general trend of the inoculation results, and they have encouraged the hope that, with the larger dose of Pfeiffer's organism now employed, the vaccine, should it be needed, may prove a powerful reinforcement to other measures of protection.

Explanation of the Table.

A few words are called for in explanation of the table. The individual returns are shown under the name of the unit or the principal station in or near which the soldiers in question were located. The period covered by each return is shown in a separate column. The "strength" is the "average strength" of the unit or station; no other method was possible in view of the fluctuations of the population. The "inoculated" include those inoculated before the period in question, as well as those done during it, while the "uninoculated" are arrived at by deducting the inoculated from the average strength. The number of cases, complications, and deaths are, of course, not averages, but actual figures derived from the hospital records. The recording of pulmonary complications is probably lacking in uniformity, since different medical officers may have taken different views as to the

TABLE OF RESULTS OF INFLUENZA INOCULATIONS IN THE HOME COMMANDS, 1918–19.

—	Period covered by return.	Average strength during period. All ranks.	Number inoculated. 1 dose only.	Number inoculated. 2 doses.	Number of cases of influenza during period. Inoc.	Number of cases of influenza during period. Non-Inoc.	Incidence of attack per 1000. Inoc.	Incidence of attack per 1000. Non-inoc.	Number of cases in which pulmonary complications occurred. Inoc.	Number of cases in which pulmonary complications occurred. Non-inoc.	Deaths. Inoc.	Deaths. Non-inoc.
Northern Command.												
1. Cramlington	31/12/18–28/2/19	1000	20	230	4	40	16·0	53·3	—	—	—	—
2. Wallsend	1/11/18–30/11/18	2149	774	591	1	5	0·7	6·4	—	1	—	1
3. Forest Hall	1/11/18–30/11/18	841	30	57	—	17	0	22·5	—	1	—	2
4. Seaton Deleval	1/11/18–30/11/18	1100	109	94	3	24	14·7	26·7	—	—	—	—
5. York	1/2/19–30/4/19	3100	1450	50	9	240	6·0	150·0	1	65	—	25
6. Newcastle	1/11/18–30/11/18	2794	324	41	1	62	3·0	25·5	1	16	—	5
7. Catterick	1/3/19–30/4/19	3352	78	395	4	76	8·4	26·3	—	—	—	—
8. Ripon (Reserve Centre)	1/4/19–30/4/19	1824	71	1174	1	3	0·8	5·1	—	—	—	—
9. Ripon	1/11/18–30/11/18	5246	363	408	4	81	5·1	18·0	1	12	1*	3
10. Alnwick	1/11/18–30/11/18	668	25	175	—	20	0	30·0	—	—	—	—
11. Bradford	1/11/18–30/11/18	643	31	170	—	5	0	11·3	—	—	—	—
12. Tyne Garrison	1/11/18–30/11/18	5270	1048	765	6	79	3·3	22·8	—	2	—	3
13. 3rd Cheshires	1/11/18–30/11/18	2180	222	412	12	48	19·0	31·0	—	25	—	5
14. West Hartlepool	1/11/18–30/11/18	670	127	60	—	30	0	62·0	—	5	—	2
15. Clipstone	1/11/18–30/11/18	11,509	525	1734	38	228	16·8	24·6	—	2	—	4
16. Bagthorpe	1/11/18–30/11/18	800	121	31	14	6	92·0	9·4	4	2	—	2
Eastern Command.												
17. Maidstone	9/11/18–30/4/19	4197	80	410	1	504	2·0	135·9	—	403	—	41
Irish Command.												
18. Finner	1/11/18–30/11/18	760	79	559	55	36	86·0	295·0	7	11	1	2
19. Charles Fort	1/11/18–30/11/18	1453	380	191	4	7	7·0	7·6	—	—	—	—
20. Cahir	1/11/18–30/11/18	526	38	318	4	16	11·2	94·1	—	—	—	—
21. Buttevant	1/11/18–30/11/18	835	126	428	—	7	0	24·8	—	1	—	3
Western Command.												
22. Prescot	1/11/18–30/11/18	4151	489	100	1	21	1·7	5·1	—	—	—	—
Scottish Command.												
23. 4th Seaforths	1/11/18–30/11/18	2326	500	—	—	102	0	55·0	—	2	—	—
London District.												
24. Battersea	1/11/18–30/4/19	1750	—	221	59	402	267·0	263·0	12	35	—	—
—	Totals ...	59,144	7010	8614 (15,624)	221	2059	—	—	26	583	2	98

* 1 dose only.

Summary of Table.

—	Strength.	Ratios per 1000.		
		Incidence of attack.	Incidence of pulmonary complications.	Deaths.
Inoculated	15,624	14·1	1·6	0·12
Non-inoculated ...	43,520	47·3	13·3	2·25

degree of bronchial or pulmonary involvement which should be taken as a complication.

The returns, all of which lie within the period between November, 1918, and April, 1919, comprise all those relating to this period which conformed to the following requirements:—

1. That the vaccine used was that prepared at the Royal Army Medical College, according to the original formula.

2. That influenza should have been present in the unit during the period under review. In many stations where inoculation has been largely carried out there was a rapid cessation of the epidemic. Such returns would have swelled the total of the inoculations without throwing any light on their protective effects.

3. That only such returns are included as showed that at least one-tenth of the average strength had been inoculated, whether with one dose or two.

Information was asked for as to the interval occurring between inoculation and a subsequent attack of influenza, but the figures in response to this are too few to be worth analysing; it need only be said that they furnish little or no evidence of any increased susceptibility in the days immediately following inoculation, and that they throw no light of any value on the duration of the immunity conferred by the inoculations. The figures bearing on the latter point would, in any case, have been exposed to the fallacy that the epidemic was rapidly declining throughout the country, and that the inoculated population was drifting, with increasing rapidity, out of our control into civil life.

No bad effects were reported from the inoculations, and the reactions, in the overwhelming majority, were trivial or non-existent.

It will be noted from the table that nearly one-half of the inoculated had received only the first dose of the vaccine—i.e., one-third of the amount which we considered essential to effective protection. It is reasonable to assume that, had all received the full dosage, the protective results would have been still more evident. No statistical evidence bearing upon this point is, however, available.

The table had best be left to speak for itself, but it will, I think, be admitted that in general the results are encouraging and that they tend to confirm, and even strengthen, our original anticipations, which were, briefly, that at least a moderate degree of protection against infection might be expected, while more decidedly beneficial effects might be hoped for in a diminution of both the frequency and the gravity of the pulmonary complications.

Periodic returns have continued to be received since the period dealt with in the table, but these have been either negative altogether, as regards incidence of the disease, or show so few cases of influenza in either group as to be valueless from a statistical standpoint.

BRISTOL HOSPITAL SUNDAY FUND.—The Lord Mayor of Bristol has expressed his delight at the satisfactory progress of his Sunday Fund, which bids fair to show a substantial increase on last year's record total of over £5000. Collections to hand so far are bigger by 25 per cent. than the corresponding figures of last year. It is interesting to note that the movement towards coöperation between the hospitals receives such tangible support from the Bristol public, who, by means of this fund and the collections made by the various firms, show a certain approval of the principle of hospital union which has for some time past been under discussion in Bristol.

COMPLEMENT-FIXATION EXPERIMENTS IN INFLUENZA.

BY H. J. B. FRY, M.D. OXON.,
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AND
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IN the first part of a previous note[1] by one of us (H. J. B. F.) an organism isolated from cases of influenza was described and its morphological and cultural characters given. It was there stated that the serum of a patient from whose blood the organism had been isolated had shown definite complement-fixation with an antigen prepared from the organism. This result encouraged us to try a similar experiment with sera obtained from other cases of influenza, which had been investigated (H. J. B. F.) during the two previous waves of the epidemic. The sera from these cases were old at the time of this experiment. Although preserved in sealed glass capsules, and, as far as possible, kept on ice, some deterioration was to be expected. Owing to the decline of the influenza epidemic cases of recent influenza have been infrequent, but the sera from a few definite cases of a mild type have been examined together with other sera as controls. One of us (C. L.), as the pathologist in charge of the serological work of No. — General Hospital (Venereal), had very favourable opportunities for examining sera from syphilitic and other patients as controls. The complement-fixation experiments described below were carried out by him, and in order to render the test more rigid he was ignorant of the nature of the cases from which the sera were derived.

Experiments.

The experiments group themselves under the following headings:—

1. Old sera obtained from cases of influenza at the height of the epidemic 1918–19.

2. Fresh sera and cerebro-spinal fluids from recent cases of influenza.

3. Control sera (*a*) from normal individuals; (*b*) from syphilitic patients who have never had influenza; (*c*) from patients with no recent history of influenza; and (*d*) sera from patients suffering from other pyrexial diseases, typhoid fever, malaria, tuberculosis, &c.

The total number of influenza sera examined is 15, which includes: Influenza old sera, 5; influenza fresh sera, 8; and influenza cerebro-spinal fluids, 2.

Control Cases (32).

(*a*) Normal	Sera	3	with no history of influenza.. 4
	Cerebro-spinal fluid	1	
(*b*) Syphilitic sera with no history of influenza ...			10
(*c*) Syphilitic sera with histories of influenza not later than one year			6
(*d*) Sera from specific diseases	Typhoid		1
	Malaria		5
	Tuberculosis		3
(*e*) Sera from non-specific diseases			3

Serological Technique (C.L.).

(*a*) *Hæmolytic system.*—Sheeps' corpuscles were used in a 5 per cent. suspension after washing six times with saline. The corpuscular suspension was sensitised with 5 M.H.D. of rabbit anti-sheep serum (Burroughs and Wellcome) titre 1 in 2000–3000. Complement was guinea-pig's serum used fresh on the same day, and

[1] FRY: THE LANCET, 1919, ii., p. 51.

was titrated in the usual manner prior to each set of experiments.

(*b*) *Sera.*—The test sera were inactivated at 55° C. for 10 minutes, and diluted 1 in 5 after inactivation immediately before use. It was found important that the sera should be kept sterile to prevent anomalous reactions.

(*c*) *Antigen* (*H. J. B. F.*).—The source of the antigen is the strain of the bacillus obtained by blood culture from the patient whose serum, as stated previously, gave a positive complement-fixation reaction. The 24-hour growth on an agar slope (+ 10) is emulsified in 2 c.cm. sterile normal saline. The emulsion is allowed to undergo extraction in the incubator at 37° C. for 12–18 hours. It is then centrifuged at high speed for 15 minutes. The supernatant opalescent fluid is pipetted off and stored in sterile glass capsules after heating to 60° C. for one hour.

(*d*) *The test.*—The antigen-serum-complement mixture is shaken and allowed to stand half an hour at room temperature, and then incubated for half an hour at 37° C. The fully sensitised red cells are added, and the whole re-incubated for half an hour at 37° C. The readings are then taken. In general the test was performed with an antigen control, a test serum control with 1 and 2 M.H.D. of complement, and the test sera were put up with unit volumes of complement containing 1, 2, 3, and 4 M.H.D. respectively.

Experimental Results: (a) Antigen Titration.

Four different antigens were originally prepared for testing their power of absorbing complement.

Antigen (1): Saline emulsion of a 24-hour agar growth heated to 60° C. for one hour.

Antigen (2): Centrifuged extract of a 24-hour agar growth unheated.

Antigen (3): Centrifuged extract of a 24-hour agar growth heated to 56° C. for half an hour.

Antigen (4): Centrifuged extract of a 24-hour agar growth heated to 60° C. for one hour.

Antigen (3) was the one used in the preliminary experiment already reported (loc. cit.). The titre of the complement-absorbing power of each antigen was determined on the same day as the tests on the influenza sera to be reported below. Each antigen was titrated in five dilutions (1 in 5, 1 in 7½, 1 in 10, 1 in 15, and 1 in 20 respectively), and each dilution was put up with two strengths of complement, 1 and 2 M.H.D. respectively. Each set of dilutions of antigen had one control using saline instead of antigen for each strength of complement.

Antigen 1.—All controls completely hæmolysed (1 and 2 M.H.D.). Antigen dilutions with 1 M.H.D. complement 1 in 20 dilution nearly hæmolysed. Antigen dilutions with 2 M.H.D. complement, 1 in 5 dilution, nearly hæmolysed. Antigen dilutions with 2 M.H.D. complement, 1 in 7½ dilution, completely hæmolysed. Antigen (1) was therefore used in a dilution of 1 in 7½.

Antigen 2.—All controls completely hæmolysed (1 and 2 M.H.D.). Antigen dilutions with 1 M.H.D., none hæmolysed. Antigen dilutions with 2 M.H.D., none completely hæmolysed. Antigen dilutions with 2 M.H.D., 1 in 20 dilution, nearly hæmolysed. Antigen (2) was therefore used in a dilution of 1 in 30.

Antigen 3.—All controls completely hæmolysed (1 and 2 M.H.D.). Antigen dilutions with 1 M.H.D., none completely hæmolysed. Antigen dilutions with 2 M.H.D., 1 in 20 dilution, completely hæmolysed. Antigen (3) was therefore used in a dilution of 1 in 20.

Antigen 4.—All controls completely hæmolysed (1 and 2 M.H.D.). Antigen dilutions with 1 M.H.D., 1 in 15 dilution, completely hæmolysed. Antigen dilutions with 2 M.H.D., 1 in 10 dilution, completely hæmolysed. Antigen (4) was therefore used in a dilution of 1 in 15.

(*b*) *Complement-Fixation Tests.*

Five old sera from influenza cases were then tested with each of the four antigens, the latter being put up in the dilutions stated above.

Antigen (1) 1 in 7½, Antigen (2) 1 in 30, Antigen (3) 1 in 20, Antigen (4) 1 in 15. For each serum there were three serum controls and three reaction tubes, the former having 1, 2, and 3 M.H.D.'s of complement respectively, but containing saline instead of antigen. The reaction tubes had each one volume of the required dilution of antigen and one volume of complement dilution, the latter being so arranged as to give 1, 2, and 3 M.H.D.'s of complement respectively in the three reaction tubes. (Complement titration gave one volume of a dilution of 1 in 35 as containing 1 M.H.D.)

Results.

The results are shown in the Series I., in which—

+ means complete fixation of complement (no hæmolysis).

− means no fixation of complement (complete hæmolysis).

± means more than half of complement fixed (less than half hæmolysis).

∓ means less than half of complement fixed (more than half hæmolysis).

tr. means almost complete hæmolysis.

SERIES I.—*Influenza, Old Sera, 5 Cases.*

No.	Name.	Onset of disease.	Blood taken days after onset.	Antigen.	Serum control. M 1	H 2	D 3	Test. M 1	H 2	D 3	Result.
1	S	29/1/19	21	i.	+	±	−	+	+	∓	Positive.
				ii.	+	±	−	+	±	+	
				iii.	+	tr.	?	+	+	+	
				iv.	+	tr.	−	+	+	+	
2	M	10/11/18	10	i.	∓	−	−	±	−	−	Weak, positive.
				ii.	∓	−	−	+	tr.	−	
				iii.	∓	−	−	+	−	−	
				iv.	∓	−	−	+	∓	tr.	
3	C	29/10/18	21	ii.	+	−	−	+	∓	tr.	Positive.
				iii.	∓	−	−	±	∓		
4	B	20/12/18	7	i.	∓	+	−	+	+	tr.	,,
				ii.	+	+	tr.	+	+	tr.	
				iii.	+	−	−	+	+	∓	
				iv.	∓	∓	−	+	+	tr.	
5	T	27/10/18	22	i.	±	−	−	+	+	∓	,,
				ii.	±	∓	−	+	±	tr.	
				iii.	±	−	−	+	∓	tr.	
				iv.	±	−		+	∓	∓	

Remarks on Cases in Above Table.

1. Original case from which organism was derived in blood culture. Temp. 104° at b.c. Recovery. Serum taken in convalescence.

2. Temp. 102°–104°. Recovery. Blood taken during pyrexia.

3. Blood taken during convalescence 10 days after fall of temperature to normal.

4. Severe case. Both lungs involved. Blood taken during pyrexia.

5. Severe case, Temp. 104°. Blood taken 5 days after fall of temperature to normal.

The age of the sera in Series I. may account for a certain amount of fixation of complement in the serum control tubes. In each case, however, there is a greater degree of fixation of complement in the reaction tubes than in those of the controls, in some cases considerably greater. All the sera were derived from severe typical cases of influenza during the second wave of the epidemic, November, 1918, to January, 1919. Antigen 4 proved to be the most satisfactory antigen in the above series, and was at the same time the least anticomplementary.

The above results suggested further experiments with sera from more recent cases of influenza using Antigen 4, which was the one employed in all subsequent experiments. The results are given in the table (Series II.).

SERIES II.—*Influenza, Fresh Sera, 8 Cases; Cerebro-spinal Fluid, 2 Cases; Total, 10 Cases.*

No.	Name.	Onset of disease.	Blood taken days after onset.	Serum control. M 1	Serum control. H 2	Serum control. D 3	Test. M 1	Test. H 2	Test. D 3	Test. 4	Result.
1	Cpl. J.	25/6/19	2	−	−	−	±	−	−	−	Negative.
			22	−	−	−	+	+	+	+	Strong positive.
2	Pte. P.	5/7/19	1	−	−	−	±	−	−	−	Negative.
			12	−	−	−	+	+	+	+	Strong positive.
3	Pte. S.	2/7/19	3	−	−	−	tr.	−	−	−	Negative.
4	Pte. K.	21/7/19	3	−	−	−	+	+	−	−	Weak positive.
			16	−	−	−	−	−	−	−	Negative.
			25	−	−	−	+	+	+	−	Positive.
5	Pte. H.	16/7/19	7	−	−	−	+	+	+	+	Strong positive.
			21	−	−		−	−	−	−	Negative.
			30	−	−	−	−	−	−	−	"
6	L/Cpl. L.	3/8/19	6	±	−		+	−	−	−	"
			12	−	−	−	−	−	−	−	"
7	Pte. —.	3/8/19	4–5 months	−	−	−	+	+	+	−	Positive.
8	Pte. —.	3/8/19	11 months	−	−	−	+	?	±	∓	Weak positive.
			Cerebro-spinals.								
A	Capt. H.	...	...	±	±	±	+	+	−	−	Controls not satisfactory.
B	Coolie X.	...	...	−	−	−	+	+	−	−	Weak positive; for all dilutions.*

Dilutions of C.-S.F. used—1 in 1, 2 in 5, 1 in 5, and 1 in 10.
* See notes below.

Remarks on Cases in Above Table.

1. See notes below. Agglutination 1/50 with bacillary emulsion.
2. See notes below.
3. Rejected. Serum contaminated.
4. See notes below.
6. Doubtful case of influenza clinically.
7. Influenza in February, 1919, under observation for syphilis.
8. Influenza in July, 1918, under observation for syphilis.

Clinical Notes. (H. J. B. F.)

The results in certain of the experiments in Series II. are so definite that short clinical notes of the cases from which the sera were obtained are given below.

1. Cpl. J., age 29, admitted 27/6/19. History: Sudden onset with headache, fever, and weakness 25/6/19. No marked pains in body, no cough. No previous attacks of influenza. Temperature on admission 103° F. Tongue furred, face flushed, slight diminutions of breath sounds at both bases, together with fine crackling crepitations; a few rhonchi at right apex. Blood culture 27/6/19 proved sterile. 2/7/19: Temperature fell by crisis below normal, followed by rise to 102° at night; fine rhonchi, and crepitations at both bases behind, with diminished vocal fremitus. 9/7/19: Rise of temperature after being normal three days. Small patch of bronchial breathing at left base, with increased vocal resonance and crackling crepitations. 13/7/19: Percussion note impaired at both bases behind. Breath sounds absent. Vocal resonance diminished. Profuse blood-stained expectoration, continuing 3–4 days. 17/7/19: Temperature normal, lung signs diminishing, and condition good.

2. Pte. S., age 28, admitted 4/7/19. Sudden onset 2/7/19, with pain in chest and cough and blood-stained sputum. Face dusky and cyanosed. Diminution of breath sounds at both bases. No adventitious sounds. Viscid, mucinous, blood-stained expectoration. Pulse regular, but feeble. No previous attacks of influenza. 5/7/19: Blood culture and cerebro-spinal fluid both proved sterile. 6/7/19: Temperature fell from 105° to normal. No physical signs in lungs. Pulse much improved in volume and tension. Expectoration remained blood-stained for a time. 9/7/19: Rapid general improvement. No further physical signs in heart or lungs.

3. Drvr. P., age 28, admitted 5/7/19. Sudden onset 5/7/19, with fever, headache, and pains in body. T. 102·6°. Influenza two years previously. Dry cough, slight pain in right side of chest. Blood culture 6/7/19 proved sterile. 7/7/19: Temperature down to 99°. No physical signs.

4. Pte. K., age 19, admitted 23/7/19. Sudden onset 21/7/19 with pain in body, headache, and weakness in legs. Slight cough and expectoration. No previous attacks of influenza. Face dusky, eyes injected, herpes on upper lip; heart, first sound rather short and of poor quality. No physical signs in lungs. T. 101°–103·8°. 24/7/19: Blood culture proved sterile. 27/7/19: Temperature gradually falling; slight epistaxis; slight diminution of breath sounds at right base and diminished vocal fremitus. 29/7/19: Again slight epistaxis. 1/8/19: Temperature normal.

4. Pte. H., age 24, admitted 21/7/19. Malaise from 16/7/19. Worse on 20/7/19 with headache and pains in chest and weakness. Not much cough. T. 101°–102°. No physical signs. No previous history of influenza. 23/7/19: Blood culture proved sterile. 24/7/19: Temperature fell by crisis and remained normal.

6. L/Cpl. L., age 28, admitted 7/8/19. Onset with headache and pains in right side of chest. T. 103°. No previous attack of influenza. 9/8/19: Respiration difficult; pallid, sweating. Heart not enlarged; first sound rather weak, pulse fairly regular and of good volume. Percussion note resonant all over chest, vocal fremitus diminished at the bases. No adventitious sounds. Breath sounds vesicular. Sputum muco-purulent, viscid, and, slightly blood-stained. 10/8/19: A few fine crackling crepitations at left base and fine rhonchi. 12/8/19: Pale and slightly cyanosed, but better. Fine rhonchi and crepitations all over both sides of chest. Bronchial breathing over small patch below angle of right scapula. Heart slightly dilated. 12/8/19: Expectoration profuse and blood-stained. Temperature normal. 14/8/19: Much improved, very few rhonchi in lungs, a few fine crepitations in both lungs, slight diminution of vocal resonance at right base, no dullness on percussion. 16/8/19: Lungs clear of adventitious sounds. Condition good.

Cerebro-spinal Fluids.

B. Coolie X.—Onset with symptoms of influenza, T. 103° F., and signs of broncho-pneumonia in both lungs, especially left. Developed cerebral symptoms with marked rigidity of muscles of neck, with a positive Kernig's sign, and extensor plantar response. Lumbar puncture 20 c.cm. fluid removed under fair pressure, turbid, and slightly blood-stained. Films from fluid showed a few polymorphonuclears and lymphocytes. No intra- or extra-cellular cocci seen, but a few Gram-negative bacilli. Culture was obtained on Matthew's medium, but the organism was subsequently grown in pure culture on agar, and was used as a control antigen (see below). Patient died, but no post-mortem examination was permitted.

Control Experiments.

Controls were carried out on sera from normal individuals who were free from any history of influenza, on sera from patients under investigation for syphilis, and on sera from patients suffering from ascertained diseases. Two serum controls were put up with saline instead of antigen containing 1 and 2 M.H.D. of complement respectively, and four reaction tubes containing 1, 2, 3, and 4 M.H.D. complement.

1. *Normal sera.*—Three sera, with negative serum controls, from individuals who had never had influenza, were all completely negative (1, 2, 3, and 4 M.H.D.). Cerebro-spinal fluids: One normal cerebro-spinal fluid similarly gave a negative reaction (1, 2, 3, and 4 M.H.D.).

2. *Syphilitic sera.*—(*a*) With history of influenza: Of sera from 16 cases, 6 had influenza at varying dates from August, 1917, to June, 1918, of these 1 only (influenza, June, 1918) gave a partial reaction (∓ − − −). The remainder were negative in all four dilutions. (*b*) With no history of influenza: The remaining 10 sera were from syphilitic cases free from any history of influenza. The reactions were negative in all four dilutions.

3. *Sera from specific diseases.*—(*a*) Typhoid: In one case of typhoid (*B. typhosus* recovered by blood culture and from fæces) the serum taken during convalescence was negative in all four dilutions. (*b*) Malaria: Of five cases of malaria (parasites in blood films) three had a history of influenza. One with a history of influenza in July, 1916, gave an incomplete negative reaction (± ± − −), the second with a history of influenza in September, 1918, gave a doubtful reaction (± ? − −). The third, with a history of two attacks in 1912 and 1916, gave a strong positive reaction (+ + + +). The remaining two cases (Austrian prisoners) stated that they had no history of influenza. The sera gave incomplete negative reactions (+ ∓ − −) and (+ ∓ ∓ −). The blood specimens were taken a few hours after the rigor, during pyrexia. (*c*) Tuberculosis: Three cases with tubercle bacilli in sputum were investigated. One was complicated by an acute gonorrhœal infection with fever and epididymitis. The reaction was completely negative in this case, and there was no history of influenza. Of the sera from the two remaining cases one with no influenzal history gave a complete negative reaction, the other gave a positive reaction (+ + + −), but had a history of a severe fever of unknown nature in October, 1918, at the time of the influenza epidemic.

Sera from pyrexias of unknown origin (*3*).—One case of a simple catarrhal jaundice with pyrexia (blood culture sterile) gave a completely negative reaction, and the patient had never had an attack of influenza. Two other cases of pyrexia of undetermined origin, with sterile blood cultures and agglutinations negative for typhoid-paratyphoid group, gave negative reactions. There was no recent history of influenza in these cases.

Control experiments with an indifferent antigen.—An endeavour was made to control the specificity of the antigen described above by means of an antigen prepared in exactly the same manner from a lactose-fermenting coliform organism found as a contamination in the cerebro-spinal fluid of a case of influenza (v.S.). Eight sera were tested against this organism as antigen. Three of these sera from cases of influenza had given a quadruple positive reaction with the "influenza antigen," but gave a quadruple negative with the coliform organism as antigen. Five sera from cases of influenza which had given partial reactions with the "influenza antigen" gave quadruple negatives with the antigen from the coliform organism. The coliform organism did not, therefore, exhibit any of the antigenic properties shown by the organism under investigation.

Discussion of Results.

Owing to the decline in the incidence and virulence of the influenza epidemic and to difficulties connected with demobilisation, the results given above are somewhat scanty and incomplete, but are recorded under present circumstances in the hope that they may serve as a basis for criticism and further investigation. It seems legitimate to assert that the antigen prepared from the organism investigated shows definite fixation of complement with sera from cases of influenza. The results obtained in the case of the old sera are open to criticism owing to the fixation of a certain amount of complement by the sera themselves though the difference in the amount of complement fixed by the serum controls and the test sera is well marked in all the cases with Antigen 4. The old sera were all derived from severe cases, but the recent cases of influenza investigated have all been of a relatively mild type, which may perhaps account for some anomalous reactions. In Case 4 of Series II. a negative result was obtained with the serum in the third week after onset, after a weak positive reaction had been obtained with the serum in the first week. The serum obtained in the fourth week, however, gave again a fairly strong positive reaction. In Case 5 of the second series the negative results with serum obtained in the third and fourth weeks after a strong positive reaction with the serum obtained in the first week after onset may perhaps be explained by the rapid disappearance of the immune bodies after a short mild attack. This would accord with the clinical experience of second attacks of influenza at short intervals during the recent epidemic. In most cases the immune bodies as determined by the complement-fixation reaction do not appear to persist in the blood for a longer period than about one year (Case 8 and controls). Two cases, however, a malaria control and a tuberculosis control, gave strong positive reactions after three years' interval if the histories are reliable. It may be objected that mild cases of influenza are difficult to differentiate as clinical entities. The recent cases examined appeared to be genuine cases of influenza, and clinically to resemble the early cases seen in the first wave of the epidemic in the summer of 1918. It may be mentioned that two cases, which were at first considered to be cases of influenza but proved to be otherwise, gave completely negative reactions. No. 6 in Series II., though included amongst the cases of influenza, was not a typical one and the complement fixation reactions were negative.

It is significant that there was no case free from any history of influenza which gave a positive reaction, except two cases of malaria with doubtful histories, while no case with a definite recent history of influenza gave a completely negative reaction. In Cases 1 and 2 of Series II. a negative reaction with serum obtained shortly after the onset of the disease was followed by a strong positive reaction with sera obtained in the third and second weeks respectively, indicating the production during the course of the disease of antibodies in response to an infective agent, which was similar in nature to the original organism isolated during the third wave of the epidemic in February, 1919. It should also be noticed that in Case 1, Series II., an agglutination reaction to the same organism was obtained with serum at different periods of the disease in dilutions of 1/50 to 1/125 (Dreyer's technique). These results therefore bring the recent infections into relation with those of the previous waves of the epidemic by a common antigenic factor.

Summary.

1. An antigen prepared from an organism isolated in the third wave of the epidemic shows fixation of complement with sera derived from cases of influenza, both recent and those occurring in the previous waves of the epidemic.

2. This complement-fixation is absent in the case of sera from normal individuals who have never had influenza.

3. It is absent in the case of sera from individuals who are suffering from other specific diseases and are free from any recent history of influenza.

4. An antigen prepared from another organism shows no fixation of complement with sera from cases of influenza.

THE PERIODICITY OF INFLUENZA.

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Dr. John Brownlee, statistician to the Medical Research Committee, in an article published in THE LANCET recently,[1] gave evidence that influenza has a periodicity of 33 weeks—i.e., that epidemic waves recur at intervals averaging 33 weeks, or multiples of 33 weeks. He further pointed out that from July 13th to March 1st (the maxima of the summer wave of 1918 and of the spring wave of 1919) is 33 weeks, but that the wave having its crest in this country on Nov. 2nd, 1918, does not fall into the sequence, leaving one to infer that there were two strains of the influenzal virus in operation. The brevity of his note concealed the immense amount of work which the investigation must have involved.

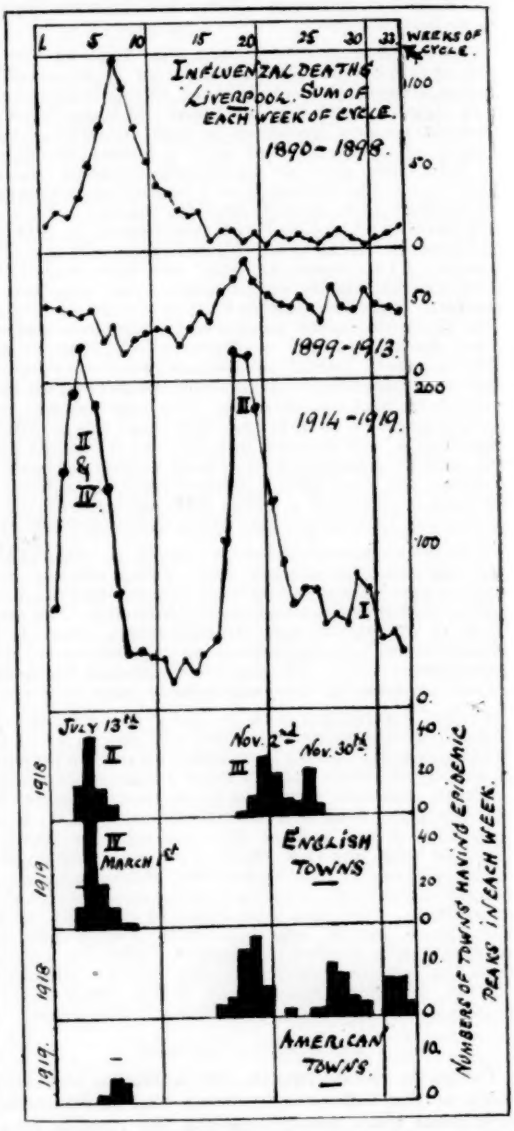
Brownlee stated that he had only been able to obtain weekly figures of deaths from influenza, pneumonia, and bronchitis for the City of London; I am able to supplement his investigation by the weekly deaths occurring in Liverpool during the period 1890–1919 that were ascribed to influenza and to all respiratory diseases. Prior to 1890 there were no deaths attributed to influenza for a number of years.

The following table is based on his periodicity of 33 weeks; starting with the first week in January, 1890, which I term the first week of the cycle, the weekly deaths are arranged in rows of 33, the resulting 33 columns being totalled for the two subperiods 1890–1913, 1914–1919; this division was adopted because from 1914 onwards there was a progressive increase in the annual number of influenzal deaths, 1917 excepted, which totalled 78, 100, 171, 55, and 1388 in successive years. The columns of the table show the weeks of the cycle of 33 weeks on which maxima occur, and the figures in brackets are the totals for those weeks:—

—	II.–IV.	III.	I.
Liverpool: Deaths from influenza—			
1890–1913	7th week (152).	19th week (81).	27th week (69).
1914–1919	4th week (221).	18th & 19th weeks (218 & 216).	29th week (80).
Liverpool: Deaths from all respiratory diseases—			
1890–1913	7th week (2729).	19th week (2565).	27th week (2484).
1914–1919	3rd week (706).	19th week (711).	—
96 English towns: Corresponding weeks of maxima 1918–19[2]	4th week (July 13th and March 1st).	20th week (Nov. 2nd).	—
American cities: Corresponding weeks of maxima 1918–19[3]	6th week (March 15th).	19th week (Oct. 26th).	31st & 32nd weeks (Jan. 18th and 25th).

I have added for the purpose of comparison the weeks corresponding to those of the cycle in which the various waves reached their crests in the greatest number of towns in England and Wales and in the United States.

Closely corresponding with Brownlee's observations on London by far the most definite periodicity is shown during the years 1890–1899, during which period there is one well-marked maximum at the seventh week of the cycle. During the period 1899–1913 a new maximum in the nineteenth week of the cycle comes into play and continues to recur until the culminating point is reached in the week ending Oct. 26th, 1918, a week earlier than in most English towns (Wave III.); a further 66 weeks carries one forward to the first week in February of this year, as Brownlee pointed out, and the outbreaks that



are being reported in Japan, Paris, Chicago, New York, &c., would show that this strain has punctually reappeared. These points are illustrated in the diagram.

There is also evidence in the table of a small maximum at the twenty-seventh week of the cycle in the earlier subperiod, and at the twenty-ninth week in the later subperiod; slight movements of the maxima forwards or backwards in the cycle over a number of years may, perhaps, indicate a periodicity slightly greater or less than 33 weeks. The twenty-ninth week of the cycle fell on the weeks ending May 18th, 1918, and Jan. 10th, 1919. An examination of the figures in Dr. Hope's annual report for Liverpool for 1918[4] shows that there was

a definite wave of influenza reaching its crest on May 18th (Wave I.), and there is also a definite rise in the deaths from influenza, respiratory diseases, and from all causes, making a small peak in the week ending Jan. 3rd, 1919, but it is hidden by the enormous waves of October and March, so that it only appears as an irregularity in the curve; but it was noted at the time that influenza had not declined in Liverpool during January in the way that it had in practically all other English towns.[5] These two waves do not appear to have played a large part in this country, but the outbreaks in the Grand Fleet in May, 1918,[6] and also in Spain, Glasgow, &c., may, perhaps, be attributed to it. In the U.S.A. in January, 1919, it would appear to have played a much larger part. In a large number of American cities two waves were experienced, the first being the October wave; the crest of the second wave sometimes fell in March, as did one of the crests in this country, but in a number of instances—e.g., Cambridge, Washington, San Francisco, New Orleans, &c.—it fell in January, or to be exact, in the thirty-first and thirty-second weeks of the cycle. The close relationship of Liverpool and Glasgow with the United States through the incoming stream of American troops may perhaps account for the presence of this May wave in these two towns, and not in the rest of England.

The third maximum in the fourth week of the cycle is represented during the late outbreak by the waves culminating in Liverpool, and also the greater number of English towns on the weeks ending July 13th (Wave II.) and March 1st (Wave IV.). This is a 33 weeks interval. This wave recurred at an interval of 32–34 weeks in a large number of English towns.

The annual report of the Medical Department of the Local Government Board for 1918–19 gives a valuable table (Table III.) showing the exact week in which the three main waves, summer, autumn, and spring, reached their crests or epidemic peaks in each town; this table may be epitomised so as to show the numbers of towns having their epidemic peak in successive weeks as follows:—

(II.) *Summer Epidemic (68 Towns).*

Week ending—		Week ending—	
(1) July 6th	15	(3) July 20th	12
(2) ,, 13th	36	(4) ,, 27th	5

(III.) *Autumn Epidemic (96 Towns).*

Week ending—		Week ending—	
(0) Oct. 19th	2	(4) Nov. 16th	7
(1) ,, 26th	9	(5) ,, 23rd	6
(2) Nov. 2nd	27	(6) ,, 30th	22
(3) ,, 9th	19	(7) Dec. 7th	4

(IV.) *Spring Epidemic (95 Towns).*

Week ending—		Week ending—	
(1) Feb. 22nd	12	(4) March 15th	10
(2) March 1st	50	(5) ,, 22nd	1
(3) ,, 8th	21	(6) ,, 29th	1

Of these towns only 65 are shown as experiencing all three waves, and the remainder, including both towns having their maxima in the week ending Oct. 19th, may be excluded for purposes of comparison. On this basis the largest number of towns fall in week (2) in each of the three epidemics, but whereas the summer and spring epidemics are practically confined to four weeks for their maxima, the autumn epidemic is spread over seven weeks. Now, on the basis of a periodicity of 33 weeks it might be expected that a town having the crest of its epidemic in any week of the summer series should have its spring recurrence in the same week or, at any rate, within a week on either side, but that there need be no such connexion between the time of the crest of the autumn wave and the times of the crests of the summer and spring waves respectively. This is suggested by the frequency curve—i.e., the distribution of the numbers of the towns as given above, and is borne out by a closer analysis. Thus of 65 towns which experienced all three waves 47 (72 per cent.) had their maxima in the summer and spring epidemics within an interval of 32–34 weeks; but comparing the week in which any given town had its epidemic peak in the summer and autumn, and autumn and spring epidemics only 27 (41 per cent.) and 31 (47 per cent.) respectively fell within the limit of a week on either side. The time relationships of the maxima in summer and spring were much closer to each other than they were to the autumn maxima.

If it should prove correct that there were three strains of the influenzal virus, each with a periodicity of about 33 weeks, and that simultaneously all three strains became enhanced in both virulence and infectivity, then we are faced with a phenomenon without an exact parallel, although the behaviour of the meningococcal viruses during the war presents some points of similarity. So far the weight of evidence leans to such an exaltation of a widespread endemic strain or strains rather than to dissemination from any particular focus in the world. In any case doubtless a good deal of spread of infection took place.

There is some evidence pointing to the existence in this country not only of a minor cycle of 33 weeks but also of a major cycle round about ten years maxima, although of varying intensity, having been reached in the years 1789–90, 1802–03, 1830–32, 1840–41, 1848–49 and 1851, 1854, 1869–70, 1879, 1890–91, 1898, and 1918–19. With the exception of 1854, all these dates are about the end of a decennium.

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AN EFFICIENT AND ECONOMICAL PYLON.

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THE important features of this pylon are: (1) A bucket moulded to fit the stump, and supported by a fibre cone with a satisfactory rim at the top; (2) simplicity of design; (3) light weight and low cost of production. All these points have been kept in view during the experimental stages of development.

Details of Construction.

I will endeavour to illustrate the most important details in the manufacture of a thigh pylon. (Fig. 1.)

The patient stands on an elevated platform 1 foot high, at the side of which is an arrangement for holding his crutch. A fine gauze bandage, 6 yards long by 6 inches wide, is unfolded and dusted with plaster-of-Paris (preferably dental plaster). It is then rolled up loosely, and, after being soaked in water for two or three

minutes, is squeezed and lightly rolled on the greased stump, so as to cover all the fitting surface required for the formation of the bucket, being careful in the process to keep well below the perineum (about 2 inches) and 1 inch below the ischial tuberosity. The bandage is carried higher on the outer side of the stump, so that when the bucket is completed the outer side of the rim at the top is generally 2 inches higher than the inner. (Fig. 2.) While applying the bandage all prominent ridges or folds on the surface are flattened out by hand.

The bucket, when formed, requires about five minutes to set hard. While it is hardening in position the measurement of the length of pylon required is taken. Before proceeding to do this it is essential to see that the anterior superior spines of the ilium are level, otherwise subsequent alterations will have to be made. With the patient standing, the distance is measured from the outer side of the top of the bucket to the platform, if possible in the direction of the heel, in the normal subject standing to attention. This measurement is noted for further reference when making the cone.

By gentle manipulation, after hardening, the bucket will slide off the stump. It is then put aside until dry, when it is strengthened by gauze bandage incorporated with a thin solution of glue in water, strength about 1 in 4. (Fig. 3.) This is accomplished by painting glue solution on the bucket while the bandage is applied. It is again put aside to dry, and when sufficiently dry a leather lining, first cut from a paper pattern, is fixed on the inside by rye flour paste or thin glue solution, the leather being sufficiently large to turn over each end. It may require several small incisions above and below to simplify turning over. While drying, contraction of the lining can be prevented by filling the bucket with dry sand.

After the lining has dried sufficiently a rubber collar is fixed to the upper end of the bucket. (Fig. 4.) The rubber collar, or top, is made in the following manner: A piece of sheet rubber $\frac{1}{8}$ inch thick, from 4 to 5 inches wide, and of sufficient length to surround the outside of the upper part of the bucket, is laid flat on a table and secured by pins or fine nails. After being well rubbed with glass-paper it is coated with good rubber tyre solution and allowed to dry. A rope is made from felt $\frac{1}{4}$ inch thick and $1\frac{1}{2}$ inches wide, and of the same length as the rubber. The felt is rolled, and by a continuous stitch through the centre is formed into a circular band. (Fig. 5.) This is placed longitudinally in the centre line of the rubber, which has been re-solutioned. (Fig. 6.)

The rubber is then folded over the cord, forming a collar which appears on section as illustration. (Fig. 7.) The flat adherent ends of the rubber surrounding the cord are held in position until dry by metal rods and clamps. The collar thus formed is a flat rubber band with a round top; the flat part, preferably $1\frac{1}{2}$ inches deep, is fixed by four or five bifurcated rivets to the outside of the top of the bucket, so that the round part clears the top. The ends of the collar are made to meet on the outer side and are kept in direct contact without a gap by covering with a small strip of leather $1\frac{1}{2}$ inches wide. The bucket is now complete. (Fig. 4.)

The Fibre Cone.

This is made from compressed cane fibre 1/16 inch thick. One end supports the bucket and the other end is fixed to a wooden block. Besides fitting the bucket, the cone is made to support the round part of the rubber collar at the top.

Cutting the fibre for the cone.—Before this is done an outline from measurements is drawn on the fibre. The length of pylon required having already been noted on the patient's first attendance, deduct from this 2 inches for the wooden block, $\frac{1}{2}$ inch for the rubber heel pad, and 1 inch for the rubber top, and in practice the result gives the measurement most suitable for the centre line of the cone. This gives a longer cone than is necessary for the finished pylon, but which when trimmed above and below to fit the bucket and wooden block will be found satisfactory in length.

Now measure the outside of the rubber collar where it is riveted to the bucket, and the outside of the bucket a few inches lower down, also the circumference of the wood block, adding to each measurement an inch for overlap. The length of fibre required (previously noted) is marked on the fibre by a straight line. This line meets at right angles at one end, the centre of measurement for the top of the bucket. Three or four inches lower down it meets at right angles the centre of the lower line of measurement of the bucket, and at the opposite end it meets at right angles the centre of the circumference of the wooden block. The ends of the top, lower, and bottom lines are connected by a straight line. This marks out the fibre required for making the cone.

Holes are punched out at equal distances from the sides of the fibre and at equal distances apart. (Fig. 8.) A space of 2 inches is allowed between each hole, which is punched $\frac{1}{2}$ inch from the edge throughout the entire length. Copper rivets are inserted in the holes on one side of the fibre. The other side is folded over and fastened on the rivets, washers are put on, and the cone riveted up.

Fixing the Bucket in the Cone.

The bucket, as previously stated, being higher on the outer side, will not fit the top of the cone as at present formed without alteration. This is made by cutting the fibre in line with the circumference of the bucket below the round margin of the collar which it supports. The bucket being pressed firmly home, it is secured to the fibre by inserting three or four copper rivets about 1 inch from the top.

Fitting the Cone to Wooden Block.

Two sizes of blocks are used, each one about 5 inches long and with a double taper. (Fig. 9.) The larger size has a diameter at the top of $3\frac{1}{2}$ inches and a tapered diameter of 3 inches. The medium size has a top diameter of 3 inches and a tapered diameter of $2\frac{1}{2}$ inches. This is the size most commonly used. The end of the fibre part of the cone forms a collar round the upper tapered part of the block, to which it is fixed by screws with washers. A rubber pad, preferably made from an old motor-car tyre cover, is fixed on the end of the block by screws. This pad is found most useful and economical.

In the case of a short thigh stump a pelvic band is fixed to the outer side of the cone above. It consists of a vertical hinged rod about 9 or 10 inches long, $\frac{1}{2}$ inch wide, and $\frac{1}{8}$ inch thick. The rod has holes drilled for riveting to the outer side of the cone above. It is fixed at right angles to a flat curved metal band about 1 inch deep and $\frac{1}{4}$ inch thick. This band is pliable. It approaches the middle line behind, curving round one side towards the middle line in front.

The joint of the vertical rod is placed as near the hip-joint as possible, the flat curved band lying in the hollow between the crest of the ilium and great trochanter. The flat band is covered with felt and leather, and is stitched to a band of webbing, which surrounds the body and is buckled on the opposite side in front.

Straps Required.

The measurements for straps may be taken when the patient first attends to have the bucket moulded on the stump.

The straps are made from strong webbing. One is made to form a waist belt. (Fig. 10.)

Two vertical straps attached to this are made to buckle with two straps attached to the centre line of the pylon, about 6 inches from the top in front and behind. Elastic webbing is preferable in the back strap to facilitate flexion at the hip-joint.

Two additional straps pointing to the opposite shoulder are fixed to the waist belt in a line taken from a point in the middle line of the front and back of the pylon, 6 inches below the top, the back strap crossing the opposite shoulder and buckling in front.

Below Knee Pylon.

The method of making the pylon for a tibial stump is similar to that of the thigh pylon, with the addition of

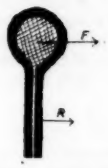
1

A general view of the thigh pylon.

5

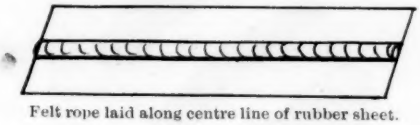
Felt rope on section. Dotted line shows stitch.

7



Rubber turned over to encircle felt rope. F, Felt rope. R, Rubber.

6



Felt rope laid along centre line of rubber sheet.

8

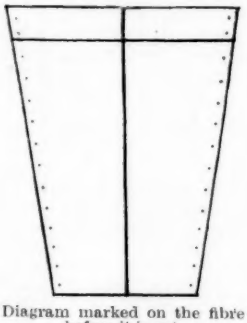


Diagram marked on the fibre before it is cut.

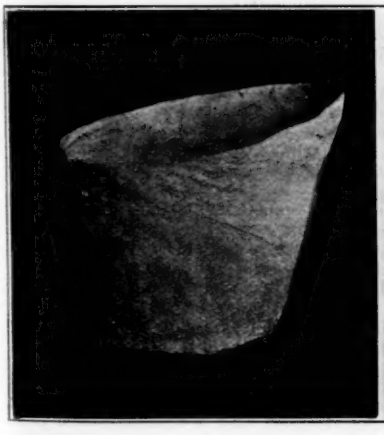
10

Pylon showing the arrangement of straps.

9

Wooden block with double taper.

2



The stump bandage.

3

Hardened plaster bucket.

4

Bucket showing rubber collar attached.

jointed side irons riveted below to the fibre cone and above to a gauntlet, which is made from fibre lined with felt and fastened by straps. (Fig. 11.) In the case of a Symes amputation a small bucket is made and inserted in the fibre cone, which has a larger wooden block fitted and padded with felt to the required

11

Pylon for a tibial stump, showing jointed side-irons.

height. The rubber for making the top of the pylon can be purchased at a low cost, as can also the rubber pads for the wooden blocks, by buying scrap motor tyre covers and tyre tubes from some motor works.

Approximate Cost.

The approximate cost is as follows:—

Material.	Quantity.	Price.
Fibre	4 sq. ft.	3 0
Wooden block	1	9
Rubber heel pad	1	2
Webbing	4 yds.	1 6
Copper rivets and washers	12 of ea.	5
Bifurcated rivets	12	6
Buckles	4	8
Plaster	2 lb.	3½
Glue	¼ lb.	3½
Bandage, gauze	12 yds.	1 6
Leather lining	1¼ sq. ft.	1 10½
Rubber top	21″ × 5″	1 0
Rubber solution	—	4
Flour paste, Enamel, Screws	—	6
		12 9½

Pelvic bands and side-irons make a slight increase in price.

Owing to the intervals required for drying purposes three days are allowed for the manufacture of the pylon, although the actual time of labour is only four hours.

The type of pylon described above is made at the B.R.C.S. Limbless Hospital, Longford Hall, Stretford, Manchester. It is comfortable to wear. The men like it and walk well in it.

For assistance in the work of its evolution I must thank the members of the Ford Motor Company's Ambulance Division, especially Mr. George Holt, whose ideas in experimental work have helped to bring about results satisfactory to the limbless men themselves. Also to Mr. Philip Buckley, limbless surgeon, and Dr. Wheeler Hart, county director, B.R.C.S., whose enthusiasm in the work was most encouraging.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

THREE CASES OF ACUTE PANCREATITIS.

BY G. PERCIVAL MILLS, F.R.C.S. ENG.,

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As the pre-operative diagnosis of acute pancreatitis is very difficult, the following three cases may be worthy of record.

CASE 1.—M. R., female, 35, single. Previous history not known. On April 20th, 1919, after mid-day dinner, complained of pain in upper abdomen and back, which gradually increased during afternoon. At 10 P.M. the pain became agonising and during night patient was rolling about on the floor and praying for death. Vomited repeatedly. Pain and vomiting continued next day though pain was less severe. I saw patient on the evening of the following day with Dr. S. Shaw. She was obviously desperately ill. Temp. 97° F. Pulse 140 and very small. Resp. 20. Abdomen rather distended but moving slightly on respiration. Attempts at deep respiration or any movement of the abdomen caused agonising pain. There was tenderness over the whole abdomen, especially in epigastrium and right and left hypochondria. There was rigidity over the upper segments of both recti—more marked on the right. Dullness on percussion in both flanks. Liver dullness normal and no jaundice.

Diagnosis.—A provisional diagnosis of perforated gastric ulcer had been made, but the following points led us to reconsider this: (1) The type of pain, causing the patient to roll about on the floor; (2) the intense pain across the back; (3) the repeated vomiting; (4) though less important, the absence of free gas in the peritoneum was unusual in such an advanced case. These facts led me to suggest, though I regret to say, not to diagnose, an acute pancreatitis.

Operation (about 36 hours after onset).—Right para-median incision above umbilicus. There was a quantity of blood-stained fluid in the peritoneum. The pancreas was swollen, and the peritoneum covering it enormously thickened by œdema. No fat-necrosis. There was a large calculus in the common duct, and the gall-bladder was full of small calculi. The gall-bladder was opened and all the calculi, including the one in the common duct, removed through it. The peritoneum was mopped dry, the gall-bladder drained, and a drainage-tube put in the pelvis. The patient was, of course, acutely ill, and the operation took 21 minutes. She was better for

a time, but died the following day. No post-mortem was permitted.

CASE 2.—Mrs. H., 35, had been suffering from epigastric pain and flatulence after meals for a week. At 11.30 P.M. on June 14th, one hour after a meal, she was suddenly seized with violent epigastric pain and pain across back, which continued without cessation all night. Vomited five or six times. She was seen by Dr. B. Tomkys at 8 A.M. He found her in acute pain, with a temperature of only 99·2° and pulse of 92. The abdomen was not distended and moved on respiration, but respirations were very shallow as patient was afraid to take a deep breath. The whole abdomen was very tender, and there was tenderness across the loins also. When I saw her at 11 A.M. the condition was as above, but the pulse had risen to 100, there was definite though slight abdominal rigidity, and the patient had vomited again. The liver dullness was normal and there was no sign of fluid in the flanks.

Diagnosis.—Dr. Tomkys, who had been present at our discussion of the previous case, suggested that this might be another acute pancreatitis. I agreed, but was not convinced that we could exclude a perforated gastric ulcer. The pain was different in type from that in the last case. She lay still and was positively afraid to move.

Operation (about 12 hours after onset).—Paramedian incision above umbilicus. Peritoneum normal. No fat-necrosis. Single stone in gall-bladder the size of hazel nut. Head of pancreas swollen and hard; peritoneum over it greatly thickened and œdematous, as also was all the tissue round the common bile-duct, so that exploration was extremely difficult. The stone was removed from the gall-bladder, which was drained, and the common bile-duct was also opened and drained. A cigarette drain was also inserted down to the opening in the duct in case of leakage. During convalescence drainage of bile was very free from the tube, which had been stitched into the common duct. Progress was uninterrupted, and in three weeks patient was getting about and taking ordinary diet. A week later, however, she had another attack of pain with nausea and considerable abdominal tenderness. When I saw her on the following day she complained of stabbing pain in the left hypochondrium on taking a deep breath. Temp. 100°, pulse 96, and there were no abdominal signs. The next day pulse and temperature were normal and the pain was gone. There was no excessive fat in the stools (12·9 per cent. of dried fæces). She was put on a modified diabetic diet and was quite well in a few days. Her doctor recently informed me that she has been quite well ever since.

CASE 3.—A. T., female, 48. Seen June 15th, 1919, at General Hospital, Birmingham. Twenty-four hours previously attack started suddenly with pain in the epigastrium and between the shoulders, associated with copious eructation of gas and bilious vomiting. Pain was greatly increased on trying to take a deep breath. Later on there was some pain in right iliac fossa also. For ten years has had occasional attacks of pain between the shoulders with much flatulence and vomiting of bile. Last attack three years ago. On examination the patient looked seriously ill. Temp. 101°, pulse 104, and resp. 48. The respiratory movements were very shallow, but abdominal movement was present. There was distinct tenderness in the epigastrium, but to a slight degree in the right iliac fossa also. There was slight rigidity of both upper recti. Liver dullness normal and no free fluid.

Diagnosis.—Probable acute pancreatitis.

Operation (24 hours after onset).—Paramedian incision above umbilicus. Peritoneum normal. No fat-necrosis. Gall-bladder full; no calculus. Pancreas swollen and hard, the peritoneum over it œdematous, and the tissues round it and the lower part of the common bile-duct fixed and hard as though by a cellulitis. On carefully examining the head of the pancreas it was seen that there were about half a dozen ashy-grey necrotic patches, about the size of grains of corn, just under the œdematous peritoneum. The peritoneum was incised over these and a cigarette drain put down to the site. The gall-bladder, which contained bile, was also drained. Convalescence was uneventful, the pulse and temperature were normal on the third day, and the patient went home in three weeks. I heard from her on Oct. 31st, four and a half months later. She had had no more pain and was much better in her general health.

Remarks.

Without wishing to dogmatise on an experience of three cases, the following conclusions suggest themselves:—

1. These are probably early cases which would go on to gangrenous pancreatitis. In one case the gangrene had commenced—e.g., the necrotic patches in the pancreas.

2. Early drainage of the biliary tract will cure them. The first case was hopeless from the start.

3. Biliary calculi need not necessarily be present.

4. Points in diagnosis: (*a*) Thin middle-aged women—not fat men as is often stated; (*b*) general resemblance to perforated gastric ulcer in the sudden onset of acute abdominal pain after a meal, with abdominal tenderness and rigidity, low temperature, rapid pulse, and shallow breathing. But (1) pain is across back as well as in epigastrium, and may at first be of the colicky type; (2) vomiting is repeated and may be associated with much eructation of gas; (3) the rigidity in the early stages is not nearly so marked as in perforated ulcer.

Finally, it is worth noting that, though one would expect a trace of jaundice, it was not present in any of the three cases. Its absence, therefore, should not influence the diagnosis of acute pancreatitis.

TRAUMATIC RUPTURE OF INTESTINE WITHOUT EXTERNAL INJURY.

BY GERTRUDE M. A. HERZFELD, M.B., CH.B. EDIN.,

ASSISTANT SURGEON, ROYAL HOSPITAL FOR SICK CHILDREN, EDINBURGH; LATE SENIOR HOUSE SURGEON, BOLTON INFIRMARY.

FIVE of these cases have occurred in Bolton Infirmary during the last two years, and, in view of the recent interesting papers by Mr. W. H. Battle and others on this subject I think the following notes may be worthy of record:—

CASE 1.—P. H., a well-developed lad of 14, was admitted at 7.30 P.M., June 24th, 1918, as a case of acute appendicitis. Temp. 101°, pulse 120. At 8.30 P.M. on the previous day, while out walking, he had stumbled and fallen heavily forwards, and a golf-ball in his right-hand coat pocket was driven into the right iliac fossa, causing such severe pain that he had to be assisted home. Shortly after reaching home he had vomited, and he had complained of constant abdominal pain up to the time of admission. I opened the abdomen at 9.30 P.M., 25 hours after the accident, by an oblique through-and-through incision in the right iliac fossa, and found a generalised peritonitis and a rupture of the ileum half an inch long, 2 feet from the ileo-cæcal valve. The appendix was normal. In addition, there were present a Meckel's diverticulum and a congenital horse-shoe kidney, the right half of which lay in the right iliac fossa, and was joined to the left half, lying partly in the pelvis, by a transverse band about 1½ inches broad. The perforation was sutured in two layers, and drainage-tubes were passed into the pelvis, kidney pouch, and right iliac fossa. The patient developed a patch of pneumonia on the tenth day, but made a good recovery and went home six weeks after operation. He is now well.

CASE 2.—G. L., male, 42, admitted Feb. 8th, 1918. Hit in the abdomen by an iron girder. Laparotomy six hours later. Lower end of ileum torn completely across,

cæcum bruised. Ileum anastomosed to transverse colon. Death five hours later.

CASE 3.—A. L., male, 45, admitted Feb. 15th, 1918. Struck in right iliac fossa by a heavy plank of wood. Laparotomy four and half hours later; small rupture of anterior wall of cæcum; suture with drainage. Recovery.

CASE 4.—J. H., male, 17, admitted August 8th, 1918. Jumped over a counter on to a broom-handle which broke, and the sharp end of the lower fragment was driven through the anus into the rectum. Laparotomy eight hours later. Perforation of rectum and of ileum; suture with drainage. Death next day.

CASE 5.—G. C., male, 43, admitted Oct. 1st, 1919. Run over by a motor charabanc. Laparotomy six hours later. Complete tear of upper ileum; end-to-end anastomosis; no drainage. Recovery.

Remarks.

Apart from freak cases, like Case 4, or the tear which occurs at the attachment of the ligament of Treitz after a drop from a height, traumatic rupture of the intestine is caused either by (1) a heavy blow or crushing injury—e.g., Cases 2, 3, and 5; or (2) a sharp, not necessarily heavy, blow, which takes the abdominal muscles unawares (Case 4); in both the intestine is crushed against bone, either vertebral column or ilium.

The early diagnosis of these cases is often very difficult. The immediate signs of ruptured bowel, quâ rupture, are practically nil. Pain, tenderness, vomiting, flank and liver dullness, are signs which tend to confuse rather than clarify the issue. Especially is this the case where the lower thorax has been crushed as well. The pulse-rate and abdominal rigidity are of little value as early signs, but a rising pulse-rate and increasing rigidity call for immediate operation.

When in doubt it is probably wise to operate. The surgeons's point of view should surely not be "Is there evidence of ruptured intestine?" but "Is there sufficient evidence to justify exploration?"

If peritonitis with its concomitant distension, &c., is established, the operation follows the usual lines for that condition; in an early case, however, it is, I think, most important to begin with a sufficiently long incision; a small incision which subsequently has to be enlarged leads to waste of valuable time and maybe to faulty procedure. I make a paramedian incision, choosing the side according to the history or symptoms, and make it long enough to allow of a preliminary inspection before manipulation. Inspection often reveals the location of the injury and allows of adequate packing before disturbance of the abdominal contents. If, however, the first opening of the peritoneum is a mere nick, a careful watch can be kept for escape of gas; the abdominal wall should not be drawn forcibly forward at the moment of incision, as in an ordinary case, but allowed to lie naturally, while a small fold of peritoneum is lifted with forceps and nicked; otherwise one may be deceived by the inrush of air.

A resection should not, I think, be necessary; I have found the best procedure to be a lateral anastomosis between two separate tears, with, if need be, approximation of the loop. The peritoneal cavity should not be flushed out, but gently cleansed by wiping. When drainage is indicated the pelvis may be drained by a suprapubic stab, and one or other kidney pouch, but drainage should be avoided if possible.

The closure of the abdomen with through-and-through sutures of silkworm gut is especially important where the patient's general condition is bad. Wounds so closed appear to be no more liable to ventral herniæ than where suturing in layers has been done

The chief points in the after-treatment of my cases have been the Fowler position, Murphy drip, and Lane's cannulæ in the axillæ.

A NOTE ON THE INTRAVENOUS ADMINISTRATION OF MERCURIC IODIDE IN THE TREATMENT OF SYPHILIS.

BY R. L. SPITTEL, F.R.C.S. ENG.,
SURGEON, GENERAL HOSPITAL, COLOMBO.

IT is a safe statement to make that the medical world is agreed that "606" and "914" (whatever trade name they go by) are the drugs par excellence in syphilis, but it is also perhaps true to say that the majority of those with a large experience of syphilis are not disposed to rely solely on those preparations, and prefer to strengthen their action with mercury and iodides—drugs which have stood the test of time.

Salvarsan, given as it most often is by the intravenous route in a dose not far below the point of tolerance, has the advantage of the older drugs, in that these are given as a rule in smaller doses and by less direct routes. Iodides are given almost exclusively by the mouth; mercury by the mouth, inunction, intramuscular injection, and, by some, intravenously, but in small doses. Up to the present the most popular method of giving mercury with a view to reinforcing the action of salvarsan is by small weekly intramuscular injections of grey oil or calomel cream.

I here report a method of administering mercury and iodide, which I have found superior to any other. When, at the beginning of the war, there was a likelihood of a shortage of salvarsan, I experimented with arsenic, mercury, and iodide, taking as my working hypothesis dosage to the point of tolerance by the intravenous route.[1] An experience of over 4000 of these injections, during a period of four years, convinces me that the solution here advocated has only to be given a trial for its worth to be established. It is a valuable adjunct to the treatment of syphilis with salvarsan; the combination establishing a cure (as gauged by Wassermann tests, provocative and otherwise, at varying intervals) more quickly and permanently than by any other method I know.

Composition of the solution.—The solution has the following composition:—

Mercuric iodide...	50 gr. (3·24 g.)
Sodium (or potassium) iodide	8 dr. (28·42 g.)
Phenolphthalein (0·5 % solution) ...	20 m. (1 c.cm.)
Sodium hydrate (25 % solution) ...	about 2 dr.
Distilled water ... ... to	40 oz. (1000 c.cm.)

Before the addition of sodium hydrate the solution is acid; it has to be rendered slightly alkaline; the phenolphthalein it contains is both an index of correct alkalinity and a colouring agent. The sodium hydrate should be added last and gradually; once the neutral point is reached it is put in drop by drop until a brilliant and clear pink colour is obtained. The solution keeps indefinitely, and when prepared under aseptic precautions and stored in a glass-stoppered bottle is always ready for use. If kept too long it tends to become decolorised (probably from the presence of hydriodic acid); the addition then of a few drops of the

[1] Practitioner, October, 1918.

sodium hydrate solution quickly restores the necessary alkalinity and colour.

Mode of administration.—The dose for an adult is 8 to 12 c.cm. given intravenously with a 20 c.cm. or, better, a 30 c.cm. syringe. The required dose is filtered off through aseptic cotton-wool and drawn into the syringe, which is then filled to its full capacity with strained sterile or distilled water. This further dilution, with at least an equal quantity of water, preferably more, is necessary to prevent pain and thickening of the vein; a 30 c.cm. syringe is therefore necessary for the larger doses. Should any of the solution escape into the tissues outside the vein a tender induration results, as with salvarsan. Unless exceptionally well borne a dose of 12 c.cm. need not be exceeded.

Reaction.—The injection is tolerated well. Heavy doses may cause chill, fever, malaise, and abdominal pains with diarrhœa (sometimes bloody), and griping; but there is scarcely any reaction when an initial dose of 7 or 8 c.cm. is given and gradually increased by 1 or 2 c.cm. at a time, according to tolerance. Gingivitis and salivation give the clue to quantity. Heart and kidney disease need not stand in the way of careful dosage.

Results.—The rapidity with which these injections cause the disappearance of syphilitic lesions is indeed gratifying; the results are not only far quicker than those obtained with mercury and iodides given by any other methods, but often even a single injection produces an effect almost as phenomenal as salvarsan. In nerve syphilis especially some of the finest results are obtained; this is not to be wondered at when the absorptive action of iodides is remembered.

Courses of treatment.—The number of injections and the interval between them vary, of course, with the particular case. An ordinary case of secondary syphilis may be treated with five or six injections each of salvarsan and mercuric iodide, given at intervals of from seven to ten days alternately, in varying sequence or in successive courses. Often after such a series a negative Wassermann reaction is permanently obtained; if not, further courses are given to meet particular needs.

Syphilis is not a disease with which any risk should be taken; and our knowledge of blood reactions not being final, it is hardly prudent to pin our entire faith on their infallibility. It is well, therefore, to safeguard the patient by prescribing mercurial treatment by mouth or inunction (measures which have the advantage that the patient can carry them out at home) for periods varying from 8 to 12 months, according to the demands of the case. Some such routine course as the following may be begun from the day the patient comes for advice, and be carried through despite the injections. Mercury, in the form of grey powder, is to be taken for six weeks; this is followed by an interval of one month, in the middle ten days of which an iodide mixture is given, e.g.:—

℞	Potass. iodid.	5 to 20 gr.
	Liq. arsenicalis	4 m
	Extr. sarsæ liq.	1 dr.
	Syrup. glycerophosph. co....	1 dr.
	Infus. cinchon. ... ... ad	½ oz.

Sig. To be taken in a glass of milk or water twice a day.

These oral courses of mercury and iodide are to be continued for about a year.

Colombo.

VOLUNTARY CORPS OF NURSES AT NEWPORT.—At a recent meeting of the Newport Town Council the Council approved a suggestion from the medical officer of health that the ladies who had aided the nurses in the war years should be asked to form a voluntary corps to be available for service in case of outbreak of influenza. A ward has been set apart in St. Michael's Hospital for influenza patients.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

BACTERIOLOGY OF TYPHUS AND RELAPSING FEVER IN MESOPOTAMIA AND NORTHERN PERSIA.

A MEETING of this section of the Royal Society of Medicine was held on Jan. 27th, at which a paper was read by Dr. W. H. WILLCOX on Typhus and Relapsing Fever in Mesopotamia and Northern Persia. This paper was reported in THE LANCET last week.

Dr. J. C. G. LEDINGHAM showed a chart illustrating the course of the typhus and relapsing fever prevalences from October, 1917, to December, 1918, in relation to the meteorological conditions peculiar to Mesopotamia. The correspondence in time and shape of the two curves of lice-borne diseases was most striking. Both diseases started from small beginnings in the last quarter of the year and both attained maximal prevalence in April, thereafter to fall abruptly to minimal or zero figures in the hot season. The volume of the epidemics was mainly Indian, the British factor forming but an insignificant portion. During the rise of the two prevalences, when one might expect optimal conditions for the propagation of the disease by lice, the mean daily maximum temperature was gradually rising from 60° to 75° F. The relative humidity reached its maximum in January and then gradually fell, to reach its minimal of 10–25 per cent. in July, the hottest month of the year. After April conditions became increasingly unfavourable for the louse, the very high temperature with rapidly diminishing humidity interfering with breeding, whilst the hot weather led also to shedding of superfluous clothes and to excessive sweating, and consequently deprived the louse of comfortable shelter.

Bacteriological Diagnosis.

He then dealt with bacteriological diagnosis. In the case of relapsing fever this was entirely determined for notification purposes by the demonstration of the spirochæte. No case was returned as relapsing fever in the absence of a microscopic finding, and from an analysis of the laboratory findings there was a very close correspondence between the laboratory returns and the official figures. The microscopic diagnosis was a simple and straightforward procedure. It was not determined whether there were any other than the usual species of spirochæte present, for this was a difficult matter and the necessary facilities were not available. There was no reason to suppose that any insect other than the louse played the part of vector. The diagnosis of typhus fever was until the last quarter of 1918 on a clinical basis, supported by results of blood culture to exclude typhoid or paratyphoid, and microscopical examination of blood films to exclude relapsing fever and malaria. The fact that the onset of typhus or any other intercurrent infection might cause malarial parasites to appear in the peripheral circulation in a quiescent malarial subject and thereby confuse the diagnosis had to be borne in mind. In the last quarter of 1918, when typhus fever again appeared, an opportunity was afforded of supplementing the purely exclusive methods of blood culture and microscopic examination of films by the employment of the Weil-Felix reaction. A culture of the proteus strain X 19, now used almost universally for this test, was available. There was no question but that, although the actual *materies morbi* of typhus fever was still unsettled, the bacteriologist was in a position to give valuable help of a positive nature in its diagnosis. The tests carried out at the Central Laboratory, Baghdad, by Captain T. R. Bowen, R.A.M.C., under the superintendence of Major F. P. Mackie, I.M.S., had impressed him greatly and had almost persuaded him that an organism which reacted so strongly and regularly to the sera of typhus patients could be no other than the actual *materies morbi*. This was highly improbable,

however, and the phenomenon was capable of other explanation.

New Organisms.

As early as 1883 there was a record of the finding of motile spirilla in typhus blood, and since then scarcely a year had passed without some claimant coming forward with a new organism. Cocci of various kinds, including streptococci, bacilli, diplobacilli, spirilla, spirochætes, and also organisms of a more protozoal structure had been incriminated. Doubtless many of the findings were ordinary contaminations, yet the fact had to be reckoned with that at least some of the organisms recovered from typhus cases represented genuine blood invaders. Of the more recent of these might be quoted the cocci recovered by W. J. Wilson, of Belfast, in 1910. Very similar cocci of the *S. viridans* type were recovered by Penfold from the blood of typhus cases in Ireland in 1916, and also by Miss Muriel Robertson. Penfold had been able to cultivate the same coccus from monkeys inoculated with typhus blood, and with pure cultures of this coccus he noted a pyrexial phase in inoculated monkeys. Miss Robertson immunised monkeys with the coccus, but they did not prove to be immune when tested with virulent typhus blood, and reacted similarly to the untreated controls. In 1909 Horiuche recovered from the urine of some cases of typhus in Manchuria an organism which was agglutinated by the sera of typhus patients only, and that in high dilution. Wilson's experience in 1910 was similar. In 1916 Weil and Felix recovered from the urine of a typhus patient organisms of the proteus type, which were agglutinated in high dilution by typhus sera only. Later they recovered another proteus which they named X 19, and which was found to act still better in this test. During the last three years an enormous literature had accumulated on the diagnostic value of what was now called the Weil-Felix reaction, and its probable significance. Of its diagnostic value no doubts had been uttered. The serum of 90 to 100 per cent. of typhus cases would give this reaction in high dilution at some stage of the disease. Reactions had been obtained with dilutions up to 1 in 30,000, whilst control sera either did not agglutinate the organism at all, or, in a small proportion only, reacted with it in dilutions not exceeding 1 in 50. About 50 per cent. of cases would give the reaction by the fifth day, while by the tenth day practically all cases would react. A negative reaction was sufficient to suggest a diagnosis other than typhus fever.

Proteus X 19 had recently been recovered from the blood in a varying percentage of cases. Thus Zeiss got proteus from the blood in 19 out of 278 cases, but never from the blood in 167 examples of other diseases. Dienès got proteus from the blood in 30 per cent. of 14 cases. Others had been less fortunate, and Felix, in Asia Minor, failed to recover the organism in a single case of 250. Proteus X 19 was highly pathogenic to guinea-pigs and mice, but did not produce in these animals the pyrexial phase which follows the inoculation of typhus blood. Nor did immunisation with proteus render animals immune to typhus blood. The Weil-Felix reaction came most probably into the category of paragglutination phenomena from which, however, it differed in one material point—the permanence of the agglutinability of proteus with typhus sera in spite of long-continued laboratory growth. One could only assume that a particular proteus had become so serum-impressed as to retain its agglutinability for an indefinite period, and to serve as a test organism for the polyagglutinating capacity of typhus serum. While knowledge had increased of typhus diagnosis it had also increased of the part played by the louse. If the louse be admitted to be the only vector, it was necessary in the future to demonstrate any presumed typhus organism in the louse or its excreta. Accordingly the adherents of Rabinowitsch's organism, of Plotz's anaerobic organism, and of proteus X 19 had been coming forward to identify their respective organisms with the Rickettsia bodies discovered in infected louse excreta by Ricketts in 1909 and later confirmed by Rocha-Lima and Prowazek in 1916. But the Rickettsia bodies had not yet been grown, though if they had anything in common with the organisms identified with them they should have been readily cultivated.

Conclusions of French and American Investigators.

Dr. J. A. ARKWRIGHT, in the course of a review of the bacteriology of typhus fever, said that the French investigators in Tunis and the Americans working with the Mexican and New York forms of the disease arrived at the following conclusions:—

(1) The blood of human cases of typhus is infective for monkeys, and the disease can be transmitted by the blood from monkey to monkey, from monkey to guinea-pig, from guinea-pig to guinea-pig, and back again to the monkey after many passages through the guinea-pig.

(2) The virus can be conveyed by the plasma and by the serum obtained by centrifuging defibrinated blood, but not so readily by clear serum taken off the clot.

(3) The virus is destroyed by heating to 55° C. for 15 minutes and by drying in vacuo over sulphuric acid.

(4) It does not pass through an efficient Berkefeld filter in sufficient amount to cause an infection.

(5) Lice which have been infected on a human case or on a monkey can apparently convey the disease to a monkey by their bites, and inoculation of their gut contents by scarification or subcutaneous injection will infect a monkey or a guinea-pig.

(6) Typhus may be transmitted experimentally by either pediculus corporis or pediculus capitis.

(7) The experiments of Ricketts and Wilder point to a necessary incubation period in the louse before it becomes infective, but the evidence is not very complete, and at this period different observers did not agree on this point.

Cantacuzene had recently narrated instances of 15 medical men who had all been infected by the bites of one, or at most two, lice, the exact time of the biting having been accurately ascertained in some instances. The incubation period was usually 8 to 10 days, but in one case as long as 23.

The Virus of Typhus in the Louse.

The most advanced phase in our information about the virus of typhus was concerned with it as it exists in the louse. Very small bacillus-like bodies known as *Rickettsia prowazeki* were first described by H. T. Ricketts and Russell M. Wilder in April, 1910, as occurring in the blood of patients and in the body of the louse. In blood films of patients taken on the seventh to twelfth day of the disease they invariably found a short bacillus of the hæmorrhagic septicæmia type, which stained either solid or only at the poles. They estimated that they were between 300 and 2000 in 1 c.cm. of blood. In the fæces and intestine of the louse they were much more numerous. They also described and differentiated these organisms from other bacteria found in smears of lice. Our knowledge of these minute organisms had been largely advanced by Rocha-Lima in Poland in 1914–15, who first worked with Prowazek in Serbia in 1913, where both caught typhus fever, of which Prowazek died. Rocha-Lima rediscovered these forms in the louse, and Prowazek considered that they were the same that he had seen and described in the blood of patients when working at typhus in Poland in 1913. Rocha-Lima had two great advantages, for he was associated with a highly skilled entomologist, Sikora, who had made a speciality of pediculi, and he had the additional knowledge, due to Nicolle, that most guinea-pigs are susceptible to the virus of typhus. He was primarily a protozoologist, and was inclined to regard the organisms as protozoa. By collecting lice from patients and other persons, and also by feeding normal lice from Hamburg and then examining them microscopically by means of sections and smears of the gut, and also by inoculating guinea-pigs with their gut contents, he was able to determine the following points:—

(1) When pediculi were fed for from five to eight days on a typhus patient, preferably between the second and tenth day of the illness, a proportion of them were found to contain very large numbers of Rickettsia bodies, often in apparently pure culture, and these were found, not only in the lumen of the gut, but also in the epithelium of the mid-gut in masses. He found that 95 per cent. of the lice from advanced cases of the disease were infected. Before the fourth or

fifth day from the commencement of feeding the lice did not show these forms.

(2) The lice so infected were able to give the disease to guinea-pigs when crushed and injected subcutaneously. Even part of the gut of one louse was sufficient.

(3) Lice fed after the fall of temperature did not contain these bodies, and were not infective.

(4) Lice kept at a temperature of 23° C. neither became infective nor contained Rickettsia bodies, whilst a temperature of 32°–34° C. was the optimum for producing both these conditions.

(5) For lice to become infected it was not necessary that they should continue to feed on a febrile patient. If after one or two feeds in one day on a patient at the height of the disease the lice were subsequently fed on a convalescent, they became infected, and the convalescents were immune and ran no risk of infection.

(6) If lice were fed daily on a patient the proportion of those infected rose as time went on, and almost all were infected after ten days. Lice once infected usually remained so until they died, but sometimes appeared to get rid of the infection and recovered. The lice used were derived from a source free from typhus or were bred in captivity and previously fed only on healthy persons.

(7) He was unable to demonstrate the inheritance of infectivity or of the Rickettsia bodies in the louse, except in one experiment which he thought was successful.

(8) No attempts to cultivate the Rickettsia bodies from pediculi had succeeded.

Other workers had confirmed these results with some divergence of opinion in matters of detail. He found that lice fed on healthy men or on those suffering from other diseases rarely showed Rickettsia and never the intracellular form.

The most serious criticism of the significance of the rôle played by Rickettsia came in part from those who were most impressed by its importance, for Ricketts, Rocha-Lima, and Otto and Dietrich all found these bodies or forms suggesting their presence in lice believed to be normal, though they are usually described as rare. Nicolle and Brumpt, however, believed that they occurred so frequently in controls as to discount their importance. This conflicting testimony can be explained by the great difficulty or even impossibility of being sure of the nature of very small diplococcal bodies seen in a film when only a few are present, and by the existence of at least two kinds in human lice. These have been named by Rocha-Lima *R. prowazeki* and *R. quintana*, the latter being as clearly and closely associated with trench fever as is the former with typhus. It seemed very probable that the irregularities in the occurrence of Rickettsia could be attributed to trench fever infections. Dr. Arkwright had been able to see some patients with typhus in Ireland, and to collect lice from their clothes and feed normal lice on them. Rickettsia were found in the lice and their excreta in a few specimens by him in collaboration with Bacot and Duncan, but no doubt the lice were kept at too low a temperature for free development of Rickettsia. However, a monkey was infected by injecting 20 lice, and the infection was passed on to two other monkeys and to guinea-pigs. It was also shown that the monkey-louse became infected. Of 93 specimens from 3 infected monkeys, 38·7 per cent. were infected, and of over 100 from healthy monkeys none showed these forms.

Microscopical Pathology of Typhus.

An interesting observation had recently been made in the microscopical pathology of typhus. Fraenkel, Jaffe, and others had described minute nodules of cellular infiltration in the course of the arterioles, and changes in their vessel walls in various organs, in the skin lesions, and especially in the mid-brain, frozen sections of which had been stated to be sufficient to establish the diagnosis. Rickettsia had been described in these nodules. Otto and Dietrich had described agglutination of Rickettsia by the blood of typhus convalescents. Experiments with a view to producing a prophylactic vaccine or therapeutic serum had not yet given very striking results, though Nicolle and Blaizot had immunised horses with extracts of organs of infected guinea-pigs. Vaccination experiments with the heated blood of patients or with virus from other sources treated to make it innocuous, had not given encouraging results.

Among subsequent speakers Dr. WILLIAM HUNTER spoke of the accurate description of typhus fever given by Murchison, who had got so near to the mode of transmission as to recognise that actual touch was necessary. He had stated that the incubation period was from 10 to 12 days. In Serbia a remarkable accession of cases occurred exactly on the eleventh day after movement of troops was begun and as remarkable a subsidence on the same day after movement was restricted.

Dr. A. G. PHEAR said that when visiting hospitals in Southern Russia, Northern Persia, and the Caucasus, he found that no treatment was considered necessary for relapsing fever, all the patients getting well without it. This pointed to a relative immunity in those peoples among whom the disease was endemic.

SECTION OF SURGERY.

CONGENITAL DIVERTICULUM OF THE COLON.

A MEETING of this section of the Royal Society of Medicine was held on Feb. 4th, Sir JOHN BLAND-SUTTON, the President, being in the chair, when Mr. GARNETT WRIGHT read a paper on Congenital Diverticulum of the Colon. Congenital diverticula were, he said, extremely rare in connexion with the large bowel, and he thought that a case which had been under his care was worthy of record as being almost unique.

The patient was a married woman, aged 27. She had suffered from constipation and abdominal pains ever since she could remember. The griping pains and constipation had steadily increased, and for two or three days before admission to hospital constipation had been absolute and she had vomited once or twice. On examination there was definite visible peristalsis, and although the bowels were evacuated the griping pains and visible peristalsis continued. The abdomen was opened and the whole of the large intestine was found to be greatly dilated and the meso-sigmoid occupied by a cystic swelling. A longitudinal band was found to bifurcate at the commencement of the sigmoid colon, and it was evident that a diverticulum was originating at this point. It left the meso-sigmoid at its lower end and turned upwards behind the posterior parietal peritoneum, and ended in a large sac on the posterior abdominal wall behind the stomach. Complete colectomy was performed, and the ileum united to the lower part of the ileo-pelvic colon by lateral anastomosis. The patient appeared to be progressing fairly satisfactorily until the ninth day, when the temperature fell to 97° F. and vomiting set in. The abdomen was reopened, when it was found that suppuration had occurred in the anastomosis, which had given way. The patient died that evening.

Description of Specimen.

The specimen removed consisted of the termination of the ileum and the large intestine from the cæcum to the upper end of the rectum, together with the diverticulum. The colon was in a condition of moderate idiopathic dilatation, and in the recent state measured 8 ft. in length. The diverticulum, which when fresh was 37 in. long, commenced at the upper end of the sigmoid loop of the colon, running at an acute angle downwards, and entering between the layers of the meso-sigmoid. Here it occupied the concavity of the sigmoid colon and became of a very large size, being much greater in diameter than the bowel. On reaching the end of the sigmoid loop the diverticulum separated from the colon, to which up to now it was intimately adherent, and, narrowing abruptly, passed from between the layers of the meso-sigmoid to lie behind the posterior parietal peritoneum. Here it turned upwards and expanded into a large blind sac, reaching a position on the posterior abdominal wall behind the stomach, and ending in a small button-like projection. In the recent state the circumference of this portion of the diverticulum was 17 in. To facilitate description it may be said that the first part of the diverticulum was about 6 in. long; the second part was that which lay between the leaves of the meso-sigmoid; the third part was a blind sac, entirely retro-peritoneal in position.

The connexion of the tæniæ with the diverticulum was very interesting. The tænia libera was continued from the descending colon into the sigmoid, and did not reach the diverticulum at all. The

tænia omentalis bifurcated at the commencement of the diverticulum, one limb descending into the sigmoid and the other running off at an angle to reach the anterior surface of the diverticulum. Here it gradually widened out, losing its band-like appearance, and forming a fairly uniform longitudinal coat, though the main mass of the fibres could still be seen near the convexity of the diverticulum. The tænia mesenterica was continued from the descending colon directly into the posterior surface of the diverticulum, and widened out in a similar manner to the band on the anterior surface. It had no connexion with the sigmoid colon. The blood-supply of the diverticulum was derived from the inferior mesenteric artery, which was of large size.

When the peritoneal sac was dissected away it was seen that the colon and the first and second parts of the diverticulum were intimately blended. Muscular bands could be seen running from one to the other; the septum between the two was common to both and consisted of circular muscle fibres with mucous membrane on each side.

Structure of the Diverticulum.

The muscular coats consisted of an outer longitudinal, which, in the first part, was represented by the tæniæ above described, and an inner layer of circular fibres. Where the colon and diverticulum fused only circular fibres could be distinguished. The inner coat consisted of mucous membrane of the usual large intestine type, the epithelial lining being continued into the button-like projection in the apex of the blind sac. From the anatomical structure of the diverticulum it was obviously a congenital abnormality of the hind gut. The blood-supply from the inferior mesenteric vessels proved that the structure was a portion of the hind gut, while nothing but a developmental error could explain the intimate connexion between it and the colon. Professor Arthur Keith had pointed out to him (Mr. Wright) that in the hyrax double colonic cæca were normally present, arising from the transverse colon, in addition to the usually placed cæca. The bands on the colon and diverticulum combined represented the bands of a single primitive intestinal tube. It would appear that the original error in development had been in the form of a split in the primitive hind gut, the septum being placed coronally and running from the centre of the primitive tænia omentalis to the opposite side of the canals. If this were so, it seemed to him to be against the view that the diverticulum in this case was a throw-back to the colonic cæca of the hyrax, as these presumably arose by lateral bands from the intestinal canal. He could arrive at no satisfactory explanation of the phenomenon.

Literature of the Subject.

He had been unable to find more than one or two cases in the literature of a similar nature.

Meckel[1] mentioned a case of a fœtus with two cæca described by Boerhaven in 1757. Grawitz[2] described the case of a man of 55 who died of peritonitis due to intestinal obstruction, in whom a right inguinal hernial sac was occupied by a diverticulum arising from the middle of the ascending colon. It consisted of a double loop of bowel, opening by a common orifice into the ascending colon. The two loops were separated at the fundus, but were fused near the neck of the diverticulum, having an imperfect septum of mucous membrane only between them at this point. Grawitz considered that this diverticulum might have been formed from a loop of bowel being caught in the hernial sac, and a secondary fusion and breaking through of the lumen at the site of constriction.

Lockwood[3] described a case of double descending colon where the lower ends of both limbs were lost in a mass of carcinoma, but gave no anatomical details.

Hedinger[4] described a post-mortem examination on a newly-born child in whom the distal third of the appendix was thickened and nodular owing to numerous small diverticula of the mucosa, some of which reached the muscularis mucosæ only, while others extended through it and produced projections of the serous coat. He considered that these diverticula were congenital.

[1] Meckel: Tab. Anatomico-Pathologie, Tab. xiii., Fig. 4, p. 13.
[2] Grawitz: Virchow's Archiv, lxviii., p. 506.
[3] Lockwood: Brit. Med. Jour., 1882.
[4] Hedinger: Virchow's Archiv, 1904, clxxviii., pp. 24-43.

Black[5] described an enormous multilocular cystic tumour growing from the serosa at the tip of a diverticulum which sprang from the junction of the rectum and sigmoid. He gave no details as to the structure of the diverticulum, but considered it congenital in origin.

Discussion.

Professor ARTHUR KEITH said that he agreed with Mr. Wright in regarding the abnormality as being the result of a developmental reduplication or splitting of the sigmoid colon. Splitting or dichotomy of the buccal or of the rectal ends of the alimentary tract was known to occur, but there had been no clear recognition that a developmental cleavage could affect a limited and intermediate tract such as the transverse colon or sigmoid. Mr. Wright's specimen might be regarded as an example of this exceedingly uncommon type of malformation. Various forms of cleavage or septal formation were known to occur during the development of the alimentary tract of the embryo. The foregut was cleft horizontally or coronally, so that the ventral compartment became the trachea, while the dorsal part formed the œsophagus. Cleavage might occur abnormally, so that the first part of the œsophagus ended blindly, while the second part sprang from the bifurcation of the trachea. Such was not an uncommon congenital abnormality of the œsophagus. The second part of the duodenum might be the seat of another kind of septal malformation—the septum lying transversely across and completely occluding the lumen of the bowel. Another type was represented by a specimen in the Museum of the Royal College of Surgeons. In this specimen a piece of small bowel from an ox had set side by side with it a long sausage-shaped cyst, 17 inches in length, exactly similar to the small bowel in structure, save that it was lined by stratified epithelium. In this case the cleavage of the bowel had apparently taken place in a sagittal plane, for both bowel and cyst lie side by side and are suspended at the free margin of the common mesentery. In Mr. Wright's specimen the cleavage had been on a coronal plane, the primitive sigmoid being split so as to form a dorsal or abnormal sigmoid and a ventral or normal sigmoid colon. Thus we saw that abnormal cleavage might affect several parts of the alimentary tract of the embryo and might take place in a sagittal, coronal, or transverse plane. It must be remembered that a mere point of adhesion between opposite walls of the embryonic gut would, when the embryonic gut was drawn out to form the adult bowel, become a long septum or cleft. In trying to explain such a malformation as had been shown by Mr. Wright it was vain to seek light from comparative anatomy. In no animal whatsoever was duplication of the sigmoid a normal occurrence.

The abnormal parasigmoid of Mr. Wright's case showed a remarkable condition of hypertrophy. The muscular coats had evidently striven to force the fæcal contents out at the cæcal end of the parasigmoid—at least the degree of hypertrophy increased in the passage from the open mouth to the closed end of the abnormal bowel. At the open or proximal end of the parasigmoid the mucous or glandular coat measured 0·8 mm. in thickness; in the neighbouring part of the normal colon this coat had a thickness of 0·25 mm. At the same sites the muscular coats measured 0·95 mm. (0·8 mm. circular coat, 0·15 mm. longitudinal) in the first, and 0·25 mm. (0·2 mm. circular coat, 0·06 mm. longitudinal) in the second. At the distal or cæcal end of the abnormal sigmoid the mucous membrane measured 0·6 mm., and was provided with numerous solitary follicles. The muscular coats at this point measured 3·7 mm.—14 times the normal thickness. The inner or circular coat measured 2·2 mm., and the outer or longitudinal 1·5 mm. The mucous coat was bound rather firmly to the muscular coat, the submucous tissue being densely packed and much reduced in amount. At the cæcal end the muscularis mucosæ was 0·140 mm. in thickness—almost as thick as the outer muscular coats of a normal sigmoid. The inner circular and outer longitudinal coats of the muscularis mucosæ could be clearly

[5] Black: Surg., Gynecol., and Obstet., 1919, vol. xxviii., p. 473.

distinguished. Throughout the greater length of the parasigmoid there was hardly more than a trace of Auerbach's (myenteric) plexus. This was particularly the case where the muscular hypertrophy was greatest. We know that addition of new muscular fibres in the embryonic gut takes place from the stratum in which Auerbach's plexus lies. It was a remarkable fact that with such muscular hypertrophy as was seen in the distal half of the abnormal parasigmoid Auerbach's plexus should have almost disappeared. Very large isolated ganglion cells occurred at various sites in both circular and longitudinal coats.

The PRESIDENT said that on reading Mr. Wright's account of this rare diverticulum he at once suspected that it was associated with malformation of the colon. The suspicion was converted into a certainty on examining the specimen. It was an example of doubling of the large intestine. The enormous size and the thickness of the affected section were explained by the fact that it served for some years as a reservoir of fæcal material, much in the same way that a section of large intestine served for the retention and accumulation of a retrograde flow of fæces after it had been put out of action by an ileo-colic anastomosis. The portion of the colon thus put out of action in many cases became enormously distended and its walls thickened. The distension and thickening were only equalled by the alterations that took place in the stomach when the pylorus was the seat of chronic, non-cancerous, obstruction. Doubling of the large intestine was a rare malformation. An accessible record would be found in the *Glasgow Medical Journal*, 1912. It was carefully described by Mr. A. Blair Aitken, and it was illustrated by good figures. The transverse section of the pelvic colon resembled the barrels of a double-barrelled gun. Roux de Brignolles discovered a double pelvic colon whilst operating for appendicitis.[6]

APPENDICECTOMY BY A NEW ROUTE.

Mr. R. H. ANGLIN WHITELOCKE read a paper on Appendicectomy by a New Route, in which he described an operation designed for the removal of the vermiform appendix through the right iliac fossa in cases where no general exploration of the abdominal cavity was called for—i.e., in acute cases rather than chronic.

The Incision.

The incision, usually 2½ inches in length, is made ½ inch or less internal or medial to, and parallel with, the anterior superior spine of the ilium, or as near to it as practicable. The anterior superior spine, a constant and definite landmark, easily felt or demonstrated, however obese the patient, forms the centre. The cut is carried above and below this point to an equal extent, and parallel with the iliac crest and spine and the attached Poupart's ligament. The cut at once divides the skin, subcutaneous fascia, and aponeurosis of the external oblique muscles. The fibres of the internal oblique muscle are then incised, taking for a guide the white line which passes almost horizontally across the muscle from the anterior superior spine to the middle line of the body; it is bloodless, and indicates the natural division of the muscle into an upper and a lower section. The transversalis muscle is similarly treated, and through the subjacent transversalis fascia the exploring finger ascertains the precise condition of the underlying peritoneum. In uncomplicated cases, and whenever there is no evidence of suppuration, this fascia, together with the peritoneum, are divided in a direction parallel to the skin incision, medial or internal to the reflexion of the parietal peritoneum on to the iliac fossa, deep to and parallel with Poupart's ligament. Where an abscess is present or suspected it is safer to turn the peritoneum inwards or medial-wards from its reflexion behind Poupart's ligament, and to open it posteriorly from the iliac fossa. When the abdomen is opened the viscus first seen is generally (86 per cent. of cases noted) large intestine, either the first part of the ascending colon or, less frequently, the cæcum.

[6] Ann. Internat. de Chir. Gastro-intest., Paris, 1914, viii., 19-23. The President had been unable to obtain this journal.

In a simple or "interval" case the appendix is removed outside the abdomen. The wound is closed in layers with catgut sutures, the skin being brought together with silkworm-gut ligatures *interrupted* so as to allow of the escape of serum. Only a few sutures are required, since there is but little strain on the edges and the muscles tend to fall together of their own accord. When the appendix is so adherent that it cannot be delivered readily with the cæcum through the wound, as in cases of chronic abscess, the safest and easiest plan is to deal with it as a foreign body by detaching the cæcum from its root and burying the stump; the adherent and detached appendix is then seized at its divided end with forceps and pulled gently upon until it comes away. When the inflamed viscus lies in retro-cæcal or retro-peritoneal positions the muscular and mucous portions of the organ may be pulled out with ease from the inflamed and thickened peritoneal sheath, a firm rubber tube of sufficient calibre then being inserted into the track. Drainage is now seldom used except in cases of abscess. Removal of the appendix as a routine, and with it the focus of sepsis and infection, is sound, for it minimises the immediate risks and any tendency to relapse, shortens the period of drainage, or enables drainage to be dispensed with altogether.

Advantages of the Method.

Anatomical.—The anterior superior spine of the ilium is an unfailing landmark, which can readily be felt in all circumstances of life. An incision or scar running through the external oblique muscle within an inch of, and parallel with, its bony origin is practically free from strain, since it lies in a natural groove or fold of the body. The deep muscles—internal oblique and transversalis—are divided where their fibres are thickest and strongest and most capable of bearing strain—i.e., along the line which indicates their natural division into an upper and lower section. As a rule, no blood-vessels are present to require ligature, nor is any muscle nerve liable to be divided. The parietal peritoneum is here thick and taut, and well supported by extraperitoneal fat at its line of reflexion to the iliac fossa, hence it is less likely to approach the skin wound and so predispose to hernia, even after prolonged drainage. Such approximation of the peritoneum towards the skin through the muscles is perhaps the most important predisposing cause of ventral or other forms of hernia. The ascending colon or cæcum is situated in the direct route, so that the surgeon may rely on discovering the appendix at its origin free from the viscus, no matter where its body lies.

Surgical advantages.—The ilio-spinal approach to a great extent prevents the risk of ventral hernia, since the two main factors concerned in the process—pouching of the parietal peritoneum and muscle strain—are almost wholly eliminated or rendered improbable by the anatomical facts already described. The ilio-inguinal route avoids the necessity of involving the general peritoneal cavity while dealing with the appendix. By this route the peritoneum may be opened and an abscess easily reached and evacuated through the iliac fossa without the difficulties and dangers of soiling or infecting the general peritoneal cavity. The route is, therefore, unquestionably safer and in harmony with the principles of surgery. The appendix may invariably be removed at the time of the operation; the necessity for a subsequent operation is thus obviated. When drainage is established through the iliac fossa to the stump of the appendix or even into the pelvis itself, such drainage is simpler and safer than when an abscess is drained through the general peritoneal cavity; an extruded fæcal concretion may also be more readily found and safely extracted. The procedure is simpler and takes less time than the older methods. The ilio-inguinal route of approach, whether for exploration or removal, enables the surgeon to make a fair estimate of the gravity of the case before the peritoneum is opened. When the transversalis fascia is reached, digital palpation makes it possible to determine not only the presence but the precise situation of an abscess. The extra-peritoneal fat in cases of abscess

is often considerably thickened and œdematous and offers distinct resistance even in the early stages; hence if the fingers are gently pressed through the fat against the peritoneum, the resistance encountered enables the surgeon to form some idea as to whether the abscess is immediately subjacent or has passed upwards behind or to the outer side of the colon, or downwards and forwards into the pelvis. When the resistance is slight the peritonitis is almost certainly localised, and the peritoneum may be incised at a point *anterior and internal* or medial to its anatomical line of reflexion, so that the general cavity can be opened with but little risk. On the other hand, if the resistance is such as to justify the suspicion of abscess it is safer to turn the peritoneal fold inwards and forwards, to open the abscess *from behind* through the iliac fossa, and then to deal with the appendix or its concretion, and to establish drainage through the opening.

Clinical advantages.—The principal gain lies in the lessening of the period of convalescence. Prolonged drainage is seldom needed, since the actual source of disease is removed at the time, and consequently recovery is usually rapid. When no drainage is necessary the patient may be allowed out of bed as soon as the wound is quite healed (usually from the tenth to twelfth day), and is able to walk soon after.

Disadvantages of the Method.

No satisfactory exploration of the contents of the abdominal cavity can be made. The operation, however, is recommended for the removal of the appendix and not for general exploration. Laparotomy and exploration of the abdomen may be superadded by means of another incision and without detriment. It may be urged that when the mischief in the appendix is insufficient to account for the symptoms entirely, the return of the cæcum after removal of the appendix may be difficult through the small peritoneal opening. If, however, care is taken to make a free opening through the peritoneum to begin with, if the edges are well retracted, and if the exposed bowel is kept warm the difficulty will rarely be formidable and never insuperable. The provision of adequate drainage is felt to be a difficulty with those surgeons who believe that gravity plays an important rôle in abdominal drainage. An abscess in Douglas's pouch may, however, be quite as efficiently drained through the iliac fossa as through the central abdomen, provided that a sufficiently patent though pliable rubber tube is used.

Conclusions.

The operation had been practised by Mr. Whitelocke for over 12 years, and used almost exclusively during the last eight years. Out of 843 consecutive operations performed at all stages of the disease, whether simple or complicated, and at all ages ranging from 3 to 79 in both sexes, there had been in all 18 fatal cases, yielding a mortality rate of 2·25 per cent. In a recent sequence of 117 cases there had been no death, whilst the 118th and 119th had been unsuccessful. As regards remote sequelæ not a single case of hernia or abnormally weak scar had occurred.

Discussion on Mr. Whitelocke's Paper.

In the course of the discussion Mr. H. J. PATERSON said that he thought the small incision was a drawback. It was impossible to obtain adequate exposure of the abdominal contents.

Mr. W. MCADAM ECCLES said that the incision would be disastrous in a case of general peritonitis. Otherwise the method had its value. He agreed as to the occurrence of herniæ after division of the twelfth dorsal and first lumbar nerves.

Mr. R. P. ROWLANDS said that pulmonary embolism was most likely to occur from the 9th to 16th day after operation. He now usually got his patients up on the fifth day. He used to have a case of pulmonary embolism about once a year. He had not now had a case for seven years.

Mr. C. A. R. NITCH, Mr. RAYMOND JOHNSON, and the PRESIDENT also spoke, and Mr. WHITELOCKE briefly replied.

SECTION OF SURGERY: SUBSECTION OF ORTHOPÆDICS.

EXHIBITION OF CASES.

A MEETING of this section of the Royal Society of Medicine was held on Feb. 3rd, Mr. J. MUIRHEAD LITTLE, the President, being in the chair.

Double Ankylosis of the Hip.

Mr. R. C. ELMSLIE showed a case of Double Ankylosis of the Hip in a man aged 51. The condition started in 1917 with an attack of rheumatism. Ankylosis of both hips was now almost complete. He brought the case forward in order to elicit the opinions of the members as to treatment. Excision or arthroplasty was the choice, but he himself favoured excision, as after arthroplasty the flap frequently became absorbed and the condition of ankylosis recurred.

The PRESIDENT agreed that excision was the form of treatment to be preferred.

Mr. E. LAMING EVANS suggested excision of the head of the femur and perhaps a third to a half of the neck, and displacement of the stump upwards so as to get a movable false joint. Such would be better than the discomfort from which the man now suffered, both in walking and in the ordinary functions of life.

Mr. ELMSLIE said that he believed much of the disability which followed excision was due to inefficient after-treatment. An excised hip was, he thought, better than one which was chronically painful, and better than having both joints stiff.

Congenital Absence of the Ulna.

Mr. A. S. BLUNDELL BANKART showed a case of Congenital Absence of the Ulna in a child aged 10 weeks. The child was one of twins; the other was said by the mother to be normal. The right ulna was absent except for a minute portion at the elbow. The hand was slightly deflected to the ulnar side. There was a dimple in the skin over the radius. The right elbow-joint was ankylosed. There was congenital contracture of the right shoulder-joint, the upper extremity of the humerus being adducted and rotated inwards. The whole limb was smaller than the left.

The PRESIDENT remarked on the extreme rarity of absence of the ulna.

PNEUMATIC PADS IN THE TREATMENT OF UNUNITED FRACTURES OF THE HUMERUS.

Mr. C. MAX PAGE read a paper on Pneumatic Pads and their Application to the Treatment of Ununited Fractures of the Humerus. He pointed out that the principle of applying a slow acting reducing force held an important position in the correction of most deformities. A force of this kind was generally obtained from the elastic recoil of the tissues against some form of fixed splint. When some degree of reduction had been effected by such means an adjustment, or often replacement, of the apparatus became necessary in order to "recharge the recoil spring." It appeared to him that in some cases the use of pneumatic pressure could effectively add to the reducing force and increase its range of action. He had first employed pneumatic pads in 1913 in conjunction with corrective plaster jackets applied after the Abbott method. The air pad replaced the felt packing between the jacket and convexities it was desired to reduce. This application of the pads was certainly effective, and considerably increased the amount of reduction which could be effected by one jacket.

The pads were made from sections of motor inner tubes of a diameter of 2½ to 4½ inches. Convenient lengths varied from 3 to 9 inches. The ends of the section of tubing were vulcanised, and an ordinary bicycle valve was set in at a convenient position. The tube was enclosed in a fabric case of such a size as to limit its undue expansion when inflated. Pads made in this way by a competent tyre mechanic would retain pressure up to 20 or 30 lb. to the square inch, in the same degree as a bicycle tyre. These pads when inflated became cylindrical in form, and so would exert pressure evenly along the line of their axis. Clearly, however, by placing the pads between two plaster casings,

pressure could be distributed as required for any special purpose.

He had recently employed these pads in the treatment of certain ununited fractures of the humerus, the aim being to exert a graduated compression at the seat of fracture along the long axis of the bone. He considered that fractures of this bone often developed the condition of delayed or non-union on account of over-extension by the weight of the limb or from the absence of any pressure along the long axis of the bone. Pressure of this kind was undoubtedly of value in stimulating union in fractures of the tibia or femur, and there seemed to be no reason why the method should not be equally effectual when applied to the upper extremity.

The method of application was shown in the two cases of ununited humerus brought before the society, and was as follows. A plaster case is applied over the shoulder, arm, and forearm of the affected side, usually with the arm rigidly abducted, and with the elbow flexed to a right angle. A small pneumatic pad is placed under the plaster beneath the elbow, which is covered with a felt pad. When the plaster case is hard the pad is inflated to the degree necessary to push the lower fragment upwards in the axis of the bone against the upper fragment, the casing as a whole maintaining the lateral stability of the arm. He had not yet had sufficient experience of the final results to define the limitations of the method, but he thought that it afforded a simple means of applying to the humerus a method of treatment which had long been proved effectual in many cases of delayed union in the tibia.

In reply to a question by Mr. ELMSLIE, Mr. PAGE said that there was no doubt that a sufficient range of movement could be obtained by the inflation of the pad. The extent of this was determined by the diameter of the casing enclosing the tube; this could be varied as required, but was usually 2½ inches.

In reply to a question by Mr. EVANS, he said that he had seen pressure sores produced by the use of the pads employed inside spinal jackets, but not in cases of fracture of the humerus. He considered they could be avoided by reasonable precautions in the use of felt and in avoiding excessive inflation of the tube. It should be remembered that a pad could be inflated so as to exert a pressure of over 30 lb. to the square inch, when it would become as hard and resistant as a bicycle tyre.

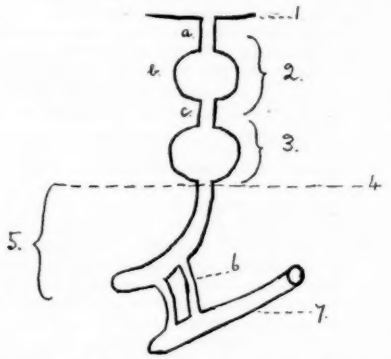
SECTION OF OBSTETRICS AND GYNÆCOLOGY.

ORIGIN OF TUMOURS OF THE OVARY.

A MEETING of this section of the Royal Society of Medicine was held on Feb. 5th, Mr. J. D. MALCOLM, the President, being in the chair.

An abstract of a paper by Dr. JAMES GOODALL on the Origin of Tumours of the Ovary was read by Dr. CUTHBERT LOCKYER, who said that in order to determine the origin of epithelial tumours of the ovary Dr. Goodall had made a study of the embryology of the organ so as to obtain first-hand knowledge of the origin and development of the epithelial structures found therein. A study of comparative embryology was necessary, and his work was based upon sections, both serial and non-serial, from the ovaries of 127 individuals of all ages, including serial sections of five human embryos. The comparative study covered some 15,000 sections from the cow, sheep, cat, mouse, rabbit, guinea-pig, and dog. Dr. Goodall laid great stress upon the importance of working with serial sections, and found that the most serviceable ovaries for study were those of the cow and dog. The close resemblance, from the developmental point of view between the mammalian ovary and testis soon became apparent to him, and he stated that there was nothing in the testicle that had not had at some time in embryonic life its homologue in the ovary. Of the permanent testicular structures, some in the ovary were transitory and disappeared completely, others degenerated but did not disappear, others remained but were modified to suit a modified function. The ovary of one mammal differed from that of another mammal in the amount of atrophy that ensued after the organ had reached its full structural development. The ovary of the cow and that of the bitch suffered the least amount of atrophy. In the ovary of the bitch was found an abundance of epithelial structures. In the medulla and among the great blood-vessels was the rete ovarii, corresponding to the rete testis. According to Dr. Goodall it is an irregular tortuous gland-like structure, with folded mucosa, lined with columnar epithelium. In the human subject it is of variable size and is a fœtal remnant, whose atrophy up to complete disappearance is quite the exception, though, at times, it is so diminutive as easily to be overlooked. Its total disappearance has often been noticed in sheep. Communicating with the rete ovarii are the medullary rays. These are irregular, convoluted, epithelial structures seen either as solid cords or as tubules, which run from the cortex to the centre of the ovary, so that they join up the rete ovarii in the medulla with the surface of the ovary externally or peripherally. They present three types of cell: (1) Shaggy, filamentous cells with basal nuclei; (2) cells syncytioid in shape; (3) cubical or duct epithelium. These types pass almost imperceptibly the one into the other. Dr. Goodall had described the development of the epithelial tissues of the ovary in detail, and their study had led him to the conclusion that there is direct continuity between the surface-epithelium of the ovary and the Wolffian duct through the medium of the medullary cords or tubules, the rete ovarii, and the Wolffian glomeruli, tubules, and duct. (See diagram.)

Diagram showing the Relation of Embryonic Structures to the Adult Ovary.



a, Pflüger's tubules atrophy and disappear. *b*, Becomes the normal Graafian follicle. *c*, Atrophies more or less, may or may not be absorbed. 1, Surface of ovum. 2, Medullary ray. 3, Rete ovarii. 4, Boundary of ovary. 5, Mesosalpinx. 6, Kobelt's tubes. 7, Gartner's duct.

This continuity of epithelial structures is best seen in the embryos of the cow, in which it had been traced as follows: Firstly, the down growth of solid cords (Pflüger's cords); secondly, these cords continued downwards as medullary cords; thirdly, the canalisation of these cords to form the tubules of the medullary rays; fourthly, the continuation of these rays into the medulla as the rete ovarii; fifthly, the continuation of the rete ovarii into the mesosalpinx to join up with the Wolffian tubules and duct. Thus, at a stage in development of the ovary of the cow, the epithelial tubular system is as perfect in its continuity as it is in the testis. Dr. Goodall had pointed out that the parts of this tubular system which occupy the cortex have to do with the generation of the reproductive elements; the remoter portions are the conduits along which ova should travel if they pursued the same course as spermatozoa in the male. But, as ova are cast off into the peritoneal cavity, the efferent tubules become useless and atrophy completely or in parts. It is the atrophy which ensues in the ovary owing to the ova pursuing a different route of migration which has led to so much confusion. A study of the adult organ cannot give any connexion whatsoever between these

various parts of one and the same system owing to the complete atrophy of intervening links.

Dr. Goodall had drawn up the following scheme to show the homologous parts of ovary and testis:—

Testis.	Origin.	Ovary.
Seminiferous tubules Vasa recta Rete testis	From germinal epithelium.	Pflüger's tubules. Vasa recta. Rete ovarii.
Efferent canals	From Wolffian body.	Kobelt's tubes of epoöphoron.
Vas deferens	From Wolffian duct.	Gartner's duct.

The development of ova.—Dr. Goodall had found immature ova developing in situ in the medullary rays and even in the rete ovarii, and he regarded this as incontrovertible evidence of the origin of these tubules from the germinal epithelium, and not, as some think, from the epoöphoron. The important function of oögenesis could not be assumed by the epoöphoron; it was essentially an ovarian function. In the lowest mammals oögenesis goes on throughout the whole of sexual life in the bitch, and, as regards the cow, at particular periods. In his opinion the syncytioid cells which form the second type of cell in the medullary rays of the bitch represent the initial stage in the development of ova, while the filamentous cells are the prototype of the zona radiata of the discus proligerus. Most of the immature ova thus deeply developed in the medullary rays and rete testis disappear.

Secondary invasion of cortex by germinal epithelium.—This had been found in the dog and other animals to occur in adult life. It was not thought that this late invasion resulted in the formation of ova. It had never been traced in the human subject, but it offered a ready explanation for that strong tendency in the human ovary for the germinal epithelium, when invaginated, to burrow and give rise to a typical new growth. Interstitial cells arise from the germinal epithelium. This had been proved by Dr. Janet Lane-Claypon and Dr. Jane McIlroy. Dr. Goodall had confirmed their findings.

Origin of Epithelial New Growths of the Ovary.

The second part of Dr. Goodall's paper dealt with the origin of epithelial new growths of the ovary, and in conclusion he discussed the possibility of the origin of perithelioma from the interstitial (epithelial) cells of the ovary. The author first pointed out that the present classifications of ovarian neoplasms was not histogenic, but rather topical, clinical, or histological. This plan had led to wholesale multiplication of varieties, and was to be condemned. He gave the following histogenetic classification: (*a*) Tumours arising from germinal epithelium; (*b*) tumours arising from the stroma; (*c*) tumours due to cell-inclusions. The division of tumours into cystic and solid was, according to Dr. Goodall, unscientific and impracticable. The epithelial structures in the ovary from which tumours might arise were germinal epithelium, follicular epithelium, ova, medullary cords, rete ovarii, corpora lutea, corpora atretica, and interstitial cells. Inclusion-tumours completed the list. The question to ask was whether tumours arose from each of the above. The decision rested upon preponderance of opinion and on personal observation. Excluding hydrops folliculi, Dr. Goodall did not believe that tumours could arise from Graafian follicles either in process of development or during degeneration; he had never seen granulosa cells lining a true cyst. He also thought that hydrops folliculi should not be classed as a tumour or even as a pathological state. Examination of these structures revealed no appreciable change in the ovum or in the membrana granulosa. A Graafian follicle never developed a papilloma. Passing to the consideration of the theca lutein cysts found in connexion with chorionic carcinoma, Dr. Goodall said: "These are true Graafian follicle cysts." The larger ones are devoid of an epithelial lining, since the ovum, being dead, "the membrana granulosa has no longer a raison d'être and slowly liquefies." It was inferred by Dr. Lockyer that the author accepted compound lutein cystoma as a new growth, since he called it "a true cyst." On the question whether the follicular cells of the primordial cell-nests give rise to epithelial tumours, the author stated that such had never been satisfactorily demonstrated, but he regarded this as unimportant, because he proposed to show that "epithelial tumours arise either from this primordial follicular epithelium or from invagination of the germinal epithelium. Small cysts, situated in the immediate neighbourhood of the surface epithelium, may so mimic the epithelium of the primordial follicle that it would be impossible to state, even at the early stage, that it arose from one or the other of these two sources."

The origin of tumours from the germ epithelium.—Dr. Goodall stated that *all* epithelial tumours (except those few which are classified as inclusion-tumours) were derived from this epithelium, either indirectly or directly, through the medium of structures to which it primarily gave rise. He observed: "When we realise that such widely different cells as the apparently simple interstitial cells of the ovary at one end of the list lead through many mutations, through the follicular epithelium, membrana granulosa, ciliated epithelium, mucous cells to the most highly specialised cell—the ovum—we do not cease to wonder at the multiplicity of varieties found among the ovarian grew growths." Dr. Goodall appeared to attribute the origin of epithelial growths to such germ epithelium as was represented by fœtal rests rather than to that which was normal to the mature gland—for example, the Graafian follicle and the primordial cell-nest. He stated that these remnants usually lay deep down in the medulla, often in the region of the rete ovarii, but they might be found in the deep crevices and lobulations of the surface, or again they might be represented by solid columns or real ducts which communicated with the surface. He said: "Other fœtal remnants are to be found in human ovaries of all ages," and that these may be discovered in "a segment which has remained fixed in a stage of imperfect development." Such lack of atrophy of fœtal structures was attributable to a vascular defect which the author regarded as of "common" occurrence, and the portion so influenced looked like a wedge-shaped infarct. It would be found to be "filled with epithelial elements and glands." In such a case the author found multiple cysts and, in one of the larger of these, the wall had become "very vascular and papillary ingrowths quite frequent." The cause of the arrested atrophy of the vascular change, which presumably accounted for it, was a problem, but in one case (a child of 5) the patient had died of chronic nephritis, secondary to scarlet fever, and in another (a girl of 18) the patient had died of a tumour of the brain of syphilitic origin, and the arteries showed obliterative endarteritis. Discussing the influence of perioöphoritis as a cause, the author said that, while it was a fruitful source of cyst-formation, he thought that new growths were not commonly associated with or secondary to inflammatory changes. Such cysts as formed subsided with the subsidence of the inflammation. But if an ovary contained many fœtal remnants perioöphoritis might act as the stimulus that started these into activity.

Tumours arising from ovules: the dermoid and teratomata.—The author stated: "Of late so much has been added to our knowledge ..... that to-day there is but little doubt that the ovules, by a system of parthenogenesis, are responsible for the presence of dermoids and teratomata." Loeb had found that parthenogenesis occurs in about 10 per cent. of guinea-pigs before they are 6 months old. In describing one of these cases Loeb had written: "We see in each case a chorionic vesicle with trophoblast and plasmodia and syncytia penetrating into the neighbouring tissue. There is also a structure present which is probably to be interpreted as the neural tube. As this type of growth occurs in the cortex of the ovary, where follicles are normally seen, and are found within follicle-like cavities, they can be derived only from ova developing parthenogenetically. Fertilisation can be excluded as the life-history of some of these animals is known and precluded such interpretation." Dr. Goodall admitted that, as yet,

there is no adequate explanation of extragenital cases. On the question whether pseudo-mucinous cysts arise from teratomata, and therefore from the ova, Landau, Hanan, Ribbert, and Askanazy were quoted by Dr. Goodall as authorities who asserted that a pseudo-mucinous cyst found in association with a teratoma is the expression of the development of the intestinal portion of the teratoma just as the teeth are the expression of its cephalic part. Nevertheless, Dr. Goodall had found mucin mixed with sebaceous material in the contents of teratomatous cysts (dermoids), and this he had shown microscopically to be due "not to a portion of the original wall of the dermoid being a mucous surface," but to the fact that the surface covered with mucous cells had once been a cyst separate and apart and had later been incorporated. However, his conclusion was "pseudo-mucinous cysts are not only ovulogenetic but are also of germ epithelial origin."

The interstitial cells of the ovary.—These cells being regarded by Dr. Goodall as of epithelial origin, he raised the question of tumour formation from this source. He said: "I think the theory quite justified that, inasmuch as peritheliomata occupy morphologically a position midway between carcinomata and sarcomata, its relative frequency in the ovary might readily be explained by assuming that it arises from the interstitial cells which occupy a position morphologically between the epithelial and connective tissue cells."

Discussion.

Commenting on the paper he had just read, Dr. CUTHBERT LOCKYER said that the connexion between the first and second parts of the paper was not obvious at first glance, but the extensive embryological research described in Part I. had apparently been undertaken by Dr. Goodall with a view to classifying ovarian tumours histogenetically. Most people were now agreed that pseudo-mucinous cysts arose from germ epithelium. Any part of the epithelial tract that remains in the adult was excluded by Dr. Goodall from being the origin of tumours, but fœtal rests (*a* to *c* on diagram) alone give rise to new growths. According to Dr. Goodall, all the structures generally regarded as epoöphoron were really oöphoron, and the Wolffian duct exists only outside, and not at all within, the ovary. As to teratomata, the work done by Dr. Herbert Williamson had hitherto been accepted as the last word on this difficult problem. Dr. Goodall's investigations favoured the parthenogenetic theory of their origin, but, while satisfactory enough as an explanation of teratomata arising in the genital organs, this theory in no way accounted for extra-genital teratomata.

Dr. HERBERT WILLIAMSON considered the paper of the very first importance, and congratulated the society on the privilege of hearing the gist of it and Dr. Cuthbert Lockyer on his admirable abstract. Dr. Goodall's paper illustrated the interesting results that could be obtained by extensive research on ovaries of other mammals and their comparison with each other and with man, and also the value of serial sections. He said that the two important points brought out in the paper were, first, the fact that structures formerly regarded as epoöphoron were really oöphoron, and next, the fact that ovarian tubules were not Wolffian but the products of germ epithelium. The Wolffian theory had been dying for some time. It was curious that Keith's work, proving that cysts known as parovarian were really rete-ovarian, was not referred to by Dr. Goodall, as it supported his conclusions. Dr. Williamson had had the privilege of reading the original paper, and had noticed one interesting point not in the abstract; this was a reference to late outgrowths of germinal epithelium in adult life. These outgrowths had been described in 1870 by Waldeyer, who pointed out that they sometimes gave rise to tumours. In another paper Waldeyer stated that he had cut serial sections of 80 ovaries which macroscopically looked normal, but which were taken from patients who had had a cyst removed from the other side. In these ovaries Waldeyer had demonstrated all stages in the formation of a cyst-adenoma, and this observation had been confirmed by the speaker. The deduction as to the origin of pseudo-mucinous cysts appeared to be justified. As to the origin of lutein cells, Goodall regarded them as developed from theca, or interstitial cells, and not from membrana granulosa. On the parthenogenetic explanation of teratomata, Dr. Williamson said that extra-genital teratomata might be due to wandering cells. Dr. Goodall's suggestion as to the origin of peritheliomata from interstitial cells evidently represented an opinion only, as he gave no evidence in support thereof.

Mr. GORDON LEY could not understand the objections to the Wolffian origin of ovarian cysts. An ovary could not be both a downgrowth and at the same time a pedunculated structure.

The PRESIDENT, after a few remarks on dermoids, asked Dr. Lockyer to convey to Dr. Goodall the thanks of the members of the section for the abstract of his valuable paper.

Mr. LEY then read a paper entitled "A Statistical Report of Carcinoma of the Ovary as met with in the Pathological Institute of the London Hospital between the Years 1907–1919 Inclusive, showing the Relative Frequency of Primary and Secondary Ovarian Carcinoma."

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At a meeting of this society, on Jan. 30th, Mr. A. A. Young, Vice-President, in the chair, Mr. Alex. MacLennan, in a communication on "The Repair, by Bone Graft, of Gaps in the Skull due to Congenital Deficiency, Injury, or Operation," said that cases of gunshot wounds of the head were probably best treated by wide removal of bone, a procedure which ensured at once obliteration of the septic region and complete decompression of the brain. Subsequent protection of the area of brain surface thus exposed was best effected by embedding under the scalp an autoplastic bone graft taken from the patient's scapula. Cases and photographs were shown illustrating the successful employment of this method of repair of cranial defects both congenital and resulting from injuries sustained in war.—Mr. John Patrick showed a patient, the whole of whose right hand, except the thumb, had, after being crushed in machinery, been amputated by Lister in Edinburgh in 1870. The thumb had gradually rotated till it now occupied almost a midpalmar position, and resembled rather a finger capable of powerful flexion. The interest of the case was both historical and economic, as the preservation of even the unopposed thumb had enabled the man to follow for the succeeding 50 years his occupation as a letterpress printer. Mr. Patrick also described some surgical conditions observed in the Salonica Army, with which he served as a temporary Colonel, R.A.M.C. The mountainous character of the country on the borders of Macedonia and Serbia had made transport of the wounded a matter of great difficulty, and the average time elapsing between wounding and operation was over 12, and not infrequently as much as 24 hours; hence by the time the patient was operated on sepsis was established and shock advanced. Gas gangrene occurred in a limited number of cases. Surgical conditions arising in connexion with the sickness prevalent in the Salonica Army, chiefly malaria and dysentery, were not many. Transfusion of blood for malarial anæmia was done with good results. Abscesses following intramuscular injections of quinine were common. A series of 35 cases of perinephric abscess were, he said, collected by himself and Colonel H. A. T. Fairbank. In these the symptoms were at first obscure, suggesting the diagnosis of malaria, phthisis, or an infection of the typhoid group. Localising signs were fullness, muscular rigidity, pain, and tenderness in the renal region. X-ray examination showed a vague shadow with obscuring of the psoas lines. Leucocytosis varied from 12,000 to 45,000. Pus was usually present in the urine in small amount. After evacuation of the abscess healing took place rapidly. Staphylococci were always found in the pus, and in some cases a history was obtained of the occurrence of boils prior to the onset of the renal symptoms. Three cases of anaphylaxis, one of them fatal, were described, associated with the prophylactic doses of antitetanic serum administered to every wounded man.—Professor Carl H. Browning discussed some points in the relationship between a positive Wassermann reaction and infectivity in cases of syphilis.—Dr. Taniguchi demonstrated cultures of *Spirochæta icterohæmorrhagiæ*.—Dr. W. Rankin showed a specimen of Papilloma of the Posterior Wall of the Stomach, about the size of a golf ball, removed by transgastric operation, in May, 1919. The patient, a woman, was well and regularly at work in January, 1920, had gained weight, and was able to take any kind of food without discomfort.

Reviews and Notices of Books.

TOTAL DIETARY REGULATION IN THE TREATMENT OF DIABETES.

By FREDERICK M. ALLEN, M.D., EDGAR STILLMAN, M.D., and REGINALD FITZ, M.D. Monographs of the Rockefeller Institute for Medical Research, No. 11. Oct. 15th, 1919. New York: Rockefeller Institute for Medical Research. 1919. Pp. 646.

IN 1913 Dr. F. M. Allen published a review of the literature of glycosuria and diabetes, with an account of numerous animal experiments he had made, and two years later he outlined a plan of treatment by prolonged fasting based upon his laboratory work. Since then he has had the opportunity of putting his methods to the test of clinical experience at the Hospital of the Rockefeller Institute, and, in conjunction with Dr. Stillman and Dr. Fitz, he has now published the results of his observations. At the outset it is emphasised that, although a basic plan of treatment is essential, every case of diabetes must be managed according to its own requirements, and that the best results are obtainable only when the treatment is intelligently individualised. The system followed at the Rockefeller Hospital is based on the principle that diabetes is a disorder of the total metabolism, not of carbohydrate utilisation alone, and that since the trouble is due to a deficiency of the nutritive function, not of nutritive materials, relief may be expected from strengthening this function, even at the price of diminished food-supply and body-weight. This end is attained by causing the patient to abstain from food at first and later by regulating the total diet according to the capacity to assimilate it—that is to say, by systematic under-nutrition. The duration of the initial fast is determined by the results of Benedict's test for sugar in the urine, feeding being resumed the day after the test becomes negative. As the chief danger threatening during the fast is acidosis, careful watch must be kept, and for this purpose the Van Slyke method for estimating the bicarbonate reserve of the blood and the nitro-prusside reaction in the plasma are recommended. The ordinary acidosis of severe diabetes is regarded as no contra-indication to beginning a fast; in fact, the more severe the acidosis the more urgently is fasting demanded, but blind persistence in withholding food may result in some cases in dangerous and even fatal acidosis, and for such patients an under-nutrition diet of either carbohydrate or protein is advised.

It is freely acknowledged that mistakes and errors of judgment have been made in applying the treatment, especially in the earlier cases. The most common mistake was an over-estimation of the patient's tolerance, with a consequently too high level of diet, and a resulting fall in the power of assimilation. In some instances patients had to be readmitted three, four, or five times for readjustment of their diet, and were discharged on each occasion with further restrictions. Such relapses might be taken to point to an inherent progressive tendency in the disease, but it is maintained that there is no real evidence of such a tendency, and the downward progress is regarded as an additional and separate process, independent of the original cause of the diabetes, and arising from the intake of an amount of food beyond the patient's tolerance. It is pointed out that relapse is common in mild cases with a manifest tendency towards recovery, where excessive diets were exhibited which could only be justified on the assumption that a short period of under-nutrition had cured the disease; relapse is rarer in severe cases which, owing to their obvious severity, were kept on low diets for fear of glycosuria and acidosis. Originally it was hoped that if freedom from glycosuria could be maintained for a prolonged period the tolerance would rise, but experience did not justify this hope—any rise appears negligible, at least in severe cases. Full recovery from diabetes is very rare, apparently, and it follows that the method of under-nutrition by which the initial success is gained must be followed in the later treatment if success is to be achieved. Theoretically, exercise might be expected to aid in the attainment of a higher level of diet and strength, but burning up calories by muscular exertion is not fully equivalent to subtracting them from the diet.

In the section on ætiology and pathology the authors lay down the dictum that diabetes is synonymous with pancreatic disease. They claim that clinical diabetes arises regularly on a basis of pancreatitis, either acute or chronic, and that the seat of the specific diabetic disturbance is now firmly established to be in the islands of Langerhans. Although they express the opinion that the pancreas is one of the most frequently diseased organs in the body, so that a strictly normal gland is rather the exception than the rule, they exclude all glycosurias not associated with pancreatic disturbance as non-diabetic, and also assume that a functional incapacity of the cell islets may be responsible for the symptoms. Considerable stress is laid on the diagnostic significance of the hydropic degeneration of the islands of Langerhans, first described by Weichselbaum and Stengl, in spite of the fact that it is acknowledged to be a result, not a cause, of the disease.

This monograph marks an epoch in the study of diabetes. While a cure for the disease has not yet been found, our knowledge is rapidly advancing in regard to the means by which life may be prolonged and the danger from complications avoided. Our thanks are due to Dr. Allen and his fellow-workers for their strenuous attempt to straighten out one of the most baffling problems of medicine, and to the Rockefeller Institute, by whose munificence the work has been rendered possible.

PSYCHOLOGY OF THE NORMAL AND SUBNORMAL.

By HENRY HERBERT GODDARD, A.M., Ph.D. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1919. Pp. 349. 2*s*.

THIS book is written primarily for teachers during or after training and for parents and the general reader. The first three chapters are concerned mainly with the anatomy and physiology of the central nervous system. A ray of light or a sound wave is supposed to stimulate a "sensory dendrite" (p. 19); nervous energy passes under the name of "neurokyme"; the patellar reflex is chosen as an instance of a simple spinal reflex (p. 20); the ascending afferent spinal paths are pictured (Fig. 25) as uncrossed until reaching the bulb; association by contiguity is identified with simultaneous association (pp. 51, 84); the degree of consciousness is supposed to depend on the number of neurons excited (p. 28). "When two stimuli, each arousing a sensation, become firmly associated, the sensations come to have meaning, and this is called perception, or judgment" (p. 180). A child first draws a man as a circular head; "soon he adds eyes, then nose, and mouth, and finally a body. ..... Evidently he puts in these various details as he gets conscious of them, as his neuron patterns develop" (p. 48). If this is the psychology that "must eventually be written from the practical standpoint in terms that can be appreciated by those ..... who do not enjoy symbols to the extent now used in psychological works," we confess to having little faith in it. It appears as crude and as inconsistent as the spellings "thru," "thot," and "brot," which the writer adopts, while retaining such spellings as "plough," "eye," and "one."

The author of this book had a great opportunity before him, but he has missed it. With vast experience among mentally defective adults and children he might have produced a work on general psychology which would have occupied the same position in relation to our knowledge of mental deficiency as, say, Stumpf's "Tonpsychologie" has filled with respect to the physiology and psychology of hearing. This we may suppose to have been originally his aim, for there are various instances recorded of the abnormal behaviour of the feeble-minded, but there is no systematic, sustained effort to build a psychology upon them.

THE ROAD TO EN-DOR.

Being an Account of How Two Prisoners of War at Yozgad in Turkey Won their Way to Freedom. By E. H. JONES, Lieutenant I.A.O.R. With illustrations by C. W. HILL, Lieutenant R.A.F. London: John Lane. 1920. Pp. 351. 8s. 6d.

THE authors have written an unvarnished, intensely humorous, and absorbing tale of barefaced deceit and trickery and the manner in which they give away their system is creditable, for had they kept their secret they might well have set up in Bond-street as "Apokaluptikos," or some such title, and raked in a large fortune. Lieutenant Jones, however, says in his preface, "If this book saves one widow from lightly trusting the exponents of a creed that is crass and vulgar, and in truth nothing better than a confused materialism, or one bereaved mother from preferring the unwholesome excitement of the séance and the trivial babble of a hired trickster to the healing power of moral and religious reflexion on the truths that give to human life its stability and worth—then the miseries and sufferings through which we passed in our struggle for freedom will indeed have a most ample reward." The book should be read, and read carefully. Every page of it is a record of masterly ingenuity, and a picture of the capability to "stick it" under most adverse circumstances which is characteristic of the higher side of human nature. Especially, Lieutenant Hill's terrible experience in the Gumush Suyu Hospital is a record of endurance which has few parallels. Against the tragedy the rest of the book is comedy of the most delightful description. The working of the "Ouija," the thought-reading exhibition, the treasure hunt, the incident of the "Four Point Receiver," and the totally innocent and unsuspecting manner in which the victims were led on to believe practically anything that Messrs. Jones and Hill wanted them to believe make most appropriate reading for these times of strain and unrest. We in no way wish to give the idea that the book is a mere record of trickery. The trickery was there it is true, but it was all part of a scheme carried out in the most deadly earnest, and only men blessed with an iron will, a gaiety of mind which refused to be beaten down, and extraordinary memories could have carried the scheme through. Accounts of escapes from prison are always fascinating reading, and this book certainly ranks among the most interesting of its kind, to say nothing of the fact that interspersed throughout the narrative are informing sidelights upon the psychology of prison life.

DENTAL CARIES IN RELATION TO ORAL OSMOSIS.

By RAGNAR ECKERMANN. London: Williams and Norgate. 1919. With 26 plates. Pp. 264. 28s.

THE author of this book would have us believe that the generally accepted view of the pathology of dental caries is wrong, and that the true explanation is the one he advances. Dental pathologists hold that caries of the teeth is a chemico-parasitic process—i.e., the inorganic matter of the tooth is dissolved by acids formed from the fermentation of carbohydrate food, and the remaining organic matter is destroyed by micro-organisms. The carious process, in the view of these pathologists, starts on the outer side of the tooth and progresses inwards. The author of this book states the converse. In his opinion there are two stages in the progress of caries. In the primary, plasma from the pulp passes through the dental structures to the outside of the tooth, the passage taken being largely determined by the direction of least resistance. The portion of the tooth invaded by the blood plasma he terms a "carious canal." This portion of the tooth is then liable to be attacked by secondary caries, a process which consists in solution of the inorganic matter, followed by breaking up of the organic matter by micro-organisms. The solution of the inorganic matter is, in his view, due to hydrochloric acid, and the micro-organisms find such food as is necessary to their existence in the blood plasma in the "carious canals."

He supports his theory by destructive criticism and by experiments and observations. His destructive criticism of the chemico-parasitic theory is most unsatisfactory: he does not seem clearly to understand the views of some of the authors he quotes, and he has an unhappy method of distorting their facts to suit his theory. We do not find his experiments conclusive, and we think that his observations are capable of a very different interpretation from that which he gives. We may quote, in justification of this criticism, his observation of that changed band of tissue which runs from the surface of the tooth to the pulp—the appearance is well known to those accustomed to prepare hard sections of carious teeth. It is this band of tissue which he calls the carious canal and which he considers is due to passage of plasma from the pulp. This transition he believes is due to an increased osmotic pressure of the saliva, consequent chiefly upon the use of salt and, to a less degree, of sugar. A far more reasonable explanation of this band of tissue, and one that is in accord with our views of general pathology, is that the changes observed are due to the natural reaction of the tooth to injury from external stimuli.

But the book is certainly interesting, if not convincing, and well worthy of perusal for many of its suggestions.

THE HEALTH OF THE TEACHER.

By Dr. W. E. CHANCELLOR. Chicago: Forbes and Co. 1919. Pp. 307. $1.25.

MOST books on hygiene begin with some account of anatomy and physiology as the basis for understanding the management of health. It is refreshing, therefore, to meet with one showing an entirely novel means of approach: "I seek to distinguish the patterns of life according to the natures of different men," the author, quoting from Plato, declares as his theme. He makes the study of individuality the first step towards promoting health—individuality, the product of physical and racial natures. He indicates the important influence of the ductless glands on the physical side, and on the racial side he identifies predominant characteristics of the nine breeds of individuals (Saxons, Scots, Irish, Dark Picts, and so forth) which are conspicuous among those who adopt the teaching profession in America. Then he proceeds to analyse human nature according to temperament (the ideo-motor, vital-corpulent, &c.). From these foundations he passes on to the study of individual cases, indicating the diseases and weaknesses to which they are likely, through their racial, physical, and temperamental constitutions, to be particularly liable. The second part of his work is primarily of an advisory nature, providing the rationale of health control.

Perhaps, on the whole, the author gives more attention to the woman teacher than to the man, but with both he is conspicuously human in his treatment of his subject, appreciating in their effect on health the circumstances and events of the teacher's daily life. He discusses, for example, questions of home life, daily journey to and from school, periodicity (diurnal, hebdomadal, mensal, annual), recreation, dress, diet, sleep—all in a simple, illuminative, novel, and thoroughly entertaining manner. To marriage as it affects the teacher he devotes considerable attention, upholding the position of the married woman teacher. On every school staff, he holds, there should be some married teachers, not only because their parental experience enables them to manage children sympathetically, but because they are healthier and live longer. Love affairs and courtship, important factors in health and efficiency, he discusses with a frankness not known in the text-books on hygiene in this country.

This book is entertaining, provocative, and so original in its presentation, that while we do not recommend it precisely as a text-book on hygiene, we do advise that it should be read in conjunction with other works on the health of the teacher. Alone, it might tend to induce undue introspection and anxiety, and because some of its dicta are based upon attractive, though as yet unsubstantiated, theories it would fail to provide an absolutely sound scientific foundation to the study of health.

Reports and Analytical Records

FROM

THE LANCET LABORATORY.

MALTO.

(THE PHŒNIX TRADING CO., LTD., LONDON.)

THE description that "malto" is a non-alcoholic beer is accurate according to the results of our analysis. On distillation a distillate was obtained showing a specific gravity of 0·999, which means that, practically speaking, alcohol was absent. Otherwise malto presented the composition of a high-gravity beer, the analysis yielding the following results: Total solids, 8·71 per cent.; mineral matter, 0·08 per cent.; malt sugar, 7·34 per cent.; proteins, 0·17 per cent.; dextrin, 1·12 per cent. There was no evidence of objectionable preservatives present and the samples examined were in sound condition and kept so. The beverage is reminiscent of brown Munich beer and has a similar malty flavour. It is agreeably but not excessively effervescing. To sum up, it possesses the same dietetic value as what is called an "extra" stout, with the important difference that it is alcohol-free. The nutritive value resides chiefly in the rich proportion of maltose and dextrin present.

POWEREX.

(POWEREX, 15, CHARLOTTE-STREET, LONDON, W.)

This is a granular powder having the appearance of dried full-cream milk. Its components include, according to statements which have reached us, glycerophosphates and pure dried cream. Our analysis gave the following results: Moisture, 7·60 per cent.; mineral matter, 8·90 per cent.; proteins, 22·33 per cent.; reducing sugar, 40·00 per cent.; phosphates (P_2O_5), 2·62 per cent. The powder dissolves to the extent of 62 per cent. in cold water. So far the claims as to its composition are borne out by this analysis. It responds quickly to the well-known tests for active enzymes. The rich proportions of fat, protein, and carbohydrate are noteworthy.

(1) DIGALEN GRANULES; AND (2) SCOPOLAMINE PREPARATIONS.

(THE HOFFMANN-LA ROCHE CHEMICAL WORKS, LTD. (BASLE), 7 AND 8, IDOL-LANE, LONDON, E.C.3.)

(1) We have before referred to the claim that digalen is a standardised solution of digitoxin, a claim which has been well supported by reliability of action in therapeutic experience. For convenience of administration digalen granules have been prepared by an approved process, each containing 1/1000 of a grain of digitoxin (Cloetta). The small dosage so presented enables the physician to keep control over the tolerance of his patient. (2) Scopolamine stable (Roche) is claimed to be a stable solution of a pure salt of lævo-rotatory hyoscine contained in ampoules of 1·1 c.cm., enabling exactly 1 c.cm. to be withdrawn by the syringe. Three strengths are supplied. Omnopon-scopolamine (Roche) is a combination of the total alkaloids of opium and scopolamine, which has been used as an adjunct to inhalation anæsthesia, and particularly in painless childbirth. A choice of three strengths is provided.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

METEOROLOGICAL OFFICE: ADVISORY COMMITTEE ON ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING

August 31st, 1919.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar.	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	57	0·09	0·56	2·15	3·19	2·28	8·27	0·72	0·93	0·08
Embankment Gardens	39	0·10	2·82	8·94	1·36	1·65	14·88	1·32	0·37	0·12
Finsbury Park	66	0·22	1·19	5·05	3·54	3·87	13·86	1·92	0·66	0·11
Ravenscourt Park	24	0·18	1·61	4·14	1·61	1·18	8·72	1·33	0·24	0·16
Southwark Park	45	0·04	1·50	4·37	1·58	1·83	9·33	1·81	0·35	0·20
Victoria Park	39	0·07	1·13	2·79	1·29	1·78	7·05	1·35	0·30	0·18
Wandsworth Com	22	0·02	0·90	2·00	0·82	0·92	4·65	0·69	0·16	0·05
Golden Lane	45	0·05	2·48	4·25	1·64	4·37	12·78	2·16	0·54	2·83
Malvern	62	Tr.	0·18	1·00	1·10	4·30	6·58	2·75	1·03	0·01
Rothamsted	62	—	0·16	0·22	1·12	3·46	4·96	—	—	—
St. Helens	127	0·20	2·64	4·98	3·99	6·60	18·41	3·30	1·65	0·18
Southport—										
Hesketh Park	87	0·02	1·08	4·14	1·48	5·04	11·76	1·51	0·74	0·05
Woodvale Moss	77	—	—	—	—	—	9·28	—	—	—
SCOTLAND.										
Glasgow—										
Alexandra Park	57	0·08	1·29	3·24	1·60	3·80	10·01	1·73	0·52	0·08
Bellahouston Pk.	63	0·01	0·87	1·52	0·95	3·69	7·04	1·48	0·19	0·04
Blythswood Sq.	65	0·08	1·94	3·86	1·63	3·63	11·14	1·81	0·23	0·11
Botanic Gdns.	66	0·05	1·24	2·94	2·43	3·30	9·96	1·34	0·17	0·05
Richmond Park	63	0·10	2·02	3·64	1·60	3·48	10·84	2·19	0·19	0·11
Ruchill Park	76	0·08	1·55	3·73	1·25	4·30	10·91	1·82	0·23	0·05
Queen's Park	67	0·00	0·58	1·81	1·02	3·65	7·06	1·59	0·16	0·05
Tollcross Park	63	0·20	2·28	6·00	1·86	4·70	15·04	2·38	0·19	Tr.
Victoria Park	65	0·07	1·24	2·88	2·15	4·35	10·69	2·09	0·21	0·09

Sept. 30th, 1919.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar.	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	27	0·10	0·68	0·80	1·29	0·87	3·74	0·32	0·23	0·02
Embankment Gardens	31	0·23	4·17	8·92	1·06	2·63	16·90	1·39	0·28	0·11
Finsbury Park	36	0·03	0·20	0·80	1·09	2·01	4·13	1·59	0·27	0·08
Ravenscourt Pk.	38	0·04	2·39	6·39	1·66	1·71	12·19	1·46	0·23	0·16
Southwark Park	35	0·06	1·91	4·58	2·17	2·63	11·35	2·11	0·35	0·07
Victoria Park	31	0·07	0·89	1·45	1·74	2·02	6·17	1·66	0·28	0·11
Golden Lane	24	0·07	1·60	3·92	0·66	2·46	8·70	1·19	0·26	0·12
Malvern	44	—	0·18	0·97	0·95	5·25	7·35	2·96	0·15	0·01
Rothamsted	29	—	0·50	0·57	0·57	1·80	3·43	—	—	—
St. Helens	62	0·11	1·74	5·84	3·03	5·13	15·85	2·71	1·26	0·10
Southport—										
Hesketh Park	60	0·03	0·54	1·24	1·20	3·28	6·29	1·14	0·66	0·05
Woodvale Moss	48	—	—	—	—	—	9·76	—	—	—
SCOTLAND.										
Glasgow—										
Alexandra Park	46	0·04	1·09	2·97	1·15	2·91	8·16	1·48	0·27	0·05
Bellahouston Pk.	46	0·02	1·07	1·86	1·04	2·44	6·43	1·61	0·49	Tr.
Blythswood Sq.	53	0·13	2·48	5·21	1·46	3·64	12·92	2·05	0·28	0·12
Botanic Gdns.	59	0·04	1·29	2·21	1·57	3·16	8·27	1·99	0·22	0·03
Richmond Park	58	0·04	1·54	3·56	1·72	3·72	10·58	2·35	0·18	Tr.
Ruchill Park	71	0·05	1·53	2·73	1·21	3·46	8·98	2·02	0·26	0·08
Queen's Park	63	0·03	0·98	2·07	0·91	3·06	7·05	1·55	0·20	Tr.
Tollcross Park	57	0·07	1·94	5·28	1·78	4·02	13·09	2·28	0·23	0·09
Victoria Park	65	0·04	1·83	3·57	1·55	4·30	11·29	1·91	0·32	0·03

There were no returns during the month of August from the following stations: Manchester (Whitworth Street Garden and Roof of College); Newcastle-on-Tyne; and Rochdale. Observations for the first time appear from the well-known Rothamsted Experimental Station, Harpenden, Mr. E. Hannaford Richards, B.Sc., of the Lawes Agricultural Trust, being responsble for the analytical results so far recorded. There were no returns from the following stations during September: London (Wandsworth Common); Manchester; Newcastle-on-Tyne; and Rochdale.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9 lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) 1 g. per sq. metre; (*d*) 1/1000 mm. of rainfall. Tr. = Trace.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables. The analyses of the rain and deposit caught in the gauge at the Meteorological Office are made in THE LANCET Laboratory.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 14, 1920.

The Origin of Man.

A SERIES of lectures on the origin of man, delivered by Professor G. ELLIOT SMITH at the Royal Institution, have been briefly reported in these columns. Their great and wide interest does not emerge from such short notices, and it is to be hoped that they will be published in full in some generally available form. The first lecture[1] was devoted primarily to the investigation of the precise nature of the determining factors that started the Primates on the particular line of development which culminated in the emergence of man. Stereoscopic vision by an animal, with hands still sufficiently plastic and unspecialised fully to take advantage of the new powers of experiment which such vision made possible, and a brain equably representing the other senses, thus enabling the animal to profit from such experience, were the fundamental factors that started our remote Eocene ancestors on the path which eventually brought some of their descendants to man's estate. Incidentally the lecture was devoted to the explanation of what evolution meant to the biologist and what world-wide wanderings were involved in the process of the evolution of the order to which man belongs.

The second lecture was concerned with the demolition of the speculations falsely called "evolution" of culture by the ethnologists, who have misunderstood what the biologist means by "evolution" and compared it with "spontaneous generation." A specific illustration was taken—the ancient American designs, in which the Indian elephant and the associated myths play a part—to demonstrate how primeval civilisation, even in the most distant parts of the world, was inspired by developments in the Ancient East, the home of invention, proving that the whole history of man's achievements in this direction was determined by the diffusion of culture throughout the world during the last 50 centuries. The third lecture, a brief abstract of which appears in our columns to-day (see p. 409) was devoted to an inquiry into the motives for and the means whereby small groups of men wandered about the world and planted the germs of civilisation in certain places and not in others. Evidence was adduced to show that if gold is the sheet-anchor of the modern world it also played a momentous part in the development of civilisation centuries before the invention of a gold currency. The process which is familiar to us in California, Ballarat, Coolgardie, Johannesburg, and Klondyke, and in the historical records of the search for the Gold Coast, the American El Dorado, the Mountains of Gold (Altai), the River of Golden Sand, and the Golden Chersonese—all this has been going on for more than 50 centuries. In the great majority of cases the spots throughout the world where the germs of civilisation took root in ancient times were the sites of gold or copper mines or of pearl beds; and the men who planted the higher culture in these localities were the miners or pearl-fishers who were exploiting these forms of wealth. The evidence in substantiation of this most important conclusion, which we owe to Mr. W. J. PERRY, of the University of Manchester, is the coincidence of the geographical distribution of megalithic monuments, practices of mummification, terraced cultivation, sun-worship, and a host of other things with ancient mines and pearl fisheries.

The fundamental problem is to determine why gold was sought so assiduously for centuries before the relatively useless plastic metal had acquired its arbitrary and artificial value as currency. The earliest place where gold is known to have been used is Egypt. Golden models of cowries were used as amulets on girdles and necklaces, as the actual shells are still used in East Africa, Oceania, and elsewhere. The Egyptian hieroglyph for gold is a picture of a girdle of cowries. The shells were used, from Upper Palæolithic times onwards, as symbols of the female pudendum—i.e., as "givers of life," and hence came to acquire the reputation of averters of death or even of the risk of death. Hence they acquired in popular imagination the most potent therapeutic powers, and were sought far and wide as amulets to confer the priceless boons of life insurance, health, fecundity, and a continuance of existence after death. So great was the social, therapeutic, and religious value acquired by cowries (as well as other shells and pearls) that the demand soon exceeded the supply. Then models of the shells were made of clay, stone, or any material that came to hand, such as the plastic yellow metal that was lying about, unused and unappreciated, in the very place between the Red Sea and the Nile where the demand first made itself felt. Gold models of the cowrie appealed to the æsthetic sense, and soon acquired a popularity far exceeding that even of the cowries themselves. In course of time the reputation for life-giving and life-preserving, which originally was associated merely with the "form" of the golden amulets, came to be transferred to the metal itself. It thus acquired the reputation for life-giving, for healing, for corpse-preserving, for averting the risk of death, and for giving "life after death," which at first belonged to the shells only. Thus gold became the most desirable stuff to secure—it appealed to man's deepest instinct of self-preservation—and from about 3500 B.C. onwards man began to ransack the whole world for this elixir of life, and incidentally the gold-miner became the missionary of civilisation, and the harbinger of the strife which greed for gold creates.

[1] The Evolution of Man and the Early History of Civilisation, THE LANCET, Feb. 7th, p. 357.

Fashion in Therapy.

THE medical profession is no more immune than any other section of the population to the influence of fashion, and this is to be expected, for medicine is not an exact science, while every trial along unexplored paths may lead to fortunate issue. If a path looks promising, as long as medical art cannot provide relief for all the ills that flesh inherits, many will go down it. When a therapeutic measure is employed for a series of years, and then is dropped suddenly, the explanation is that at last, and by common consent, it is recognised that that particular path is leading nowhere. The application of hot oil to the stump after amputation was employed for generations because surgeons had appreciated that heat was the right way in some circumstances to prevent severe septic complications; then AMBROISE PARÉ succeeded in proving, almost against his own opinion, that many patients did much better to whom this heroic treatment had not been applied. As a routine treatment hot oil was dropped, but the value of the cautery in some cases is still acknowledged. Venesection had endured for more than 2000 years as the only, or at least the best, method of dealing with inflammatory processes, until the failure of bleeding in the case of some epidemics became demonstrable, and even then the first idea to occur to the conservative mind was that there had been a change in the constitution of the populace. And so venesection persisted, and within the memory of some of our fathers most hospitals used to have a "cupper," who came daily to carry out the instructions which had been left by the physicians or surgeons; even as late as 1860 some hospital calendars contained the name of the cupper. At last the tide turned, intelligent experience of pneumonia putting an end to the general practice of venesection for inflammatory conditions. PIERRE LOUIS showed statistically, some 80 or 90 years ago, that the results obtained by less heroic methods surpassed those afforded by bloodletting. But the pendulum has swung back too far, and there is little doubt that to-day the therapeutic value of venesection is underestimated; it still has its uses and is too rarely employed. In the use of leeches also there has been a wondrous change of fashion. In 1832 21,000 leeches were used in St. George's Hospital, and in 1882 the number had fallen to 754; and we may be sure that in the 38 years that have elapsed since then the number is still more reduced. In 1832, at St. Bartholomew's Hospital, 97,300 leeches were used, and in 1882 only 1700. But there remain wise physicians who employ this simple and effective method of controlling inflammation.

The popularity of drugs with the members of the medical profession also varies greatly; it is due to the blind following of fashion that the use of drugs fell into disrepute, whence the efforts of learned pharmacologists like the late THOMAS FRASER have begun to rescue it. Sarsaparilla, especially in the form of the compound decoction, at one time had an enormous reputation; no small number of surgeons considered that it was as valuable in the treatment of syphilis as mercury itself. Sarsaparilla is now more appreciated by the customers of the herbalist than by anyone else. Yet the drug cannot be utterly without therapeutic value, even if it was formerly rated too high. Being quite unable to live up to its entire claims, it has lost credit completely, and its neglect may be an error. Arsenic, one of our most valuable pharmaceutical weapons, has been affected strangely by the passage of time, for while its real uses escaped knowledge, its possible uses were grossly exaggerated by repetitionary laudation. It was well known in some of its forms to ancient medicine, and we find it extensively employed in the Middle Ages. In the latter half of the eighteenth century it was in great repute for the treatment of malaria. Early in the nineteenth century it began to be used widely for the treatment of skin diseases, and the idea has been firmly implanted in the public mind that there are two infallible drugs for the treatment of affections of the skin, sulphur externally and arsenic internally. A reaction has long since set in, and the use of arsenic by dermatologists has diminished. In THE LANCET recently we reported a meeting of the Therapeutic Society of Paris in which the claims of arsenic for skin affections were declared to be absolutely without foundation, and this belief is shared by many authorities in this country. But there remain, perhaps, as many who, having had great experience in this department of practice, value the drug highly, and maintain that it is of excellent result if properly given. While the medicinal preparations of arsenic are thus losing hold, the organic arsenic compounds are becoming our routine weapon against syphilis.

The following of fashions is by no means harmful. Indeed, it is the right course to take so long as it is not taken in opposition to conviction, and without heed to the mental reservations that are arising. There is a real risk that in the trial of some new remedy or method the old may be forgotten, and therefore the old should not be too hastily cast aside. "Be not the first by whom the new is tried, nor yet the last to lay the old aside," is good advice in matters medical as in general life. Many will remember the enthusiasm with which vaccines were introduced into practice, when it seemed that before long it would be possible to cure every ill with a series of injections of vaccine. The present position of the use of vaccines is far below what might have been expected from what was said then. That vaccines are of value none can doubt, but their sphere of utility is circumscribed, and only too often a vaccine is prescribed because all other methods have failed. The rush to Berlin at KOCH'S announcement of his preparation of tuberculin cannot be forgotten, nor the disappointment which followed. It is certain that new fashions in medicine will be ever arising, and that the hopes raised by them will in many cases, perhaps in a majority, be disappointed. Still, out of the evil of failures true progress will be made, and we must avoid with care docile adhesion to creeds which our judgment tells us may be outworn.

The Dentist, the Welfare Centre, and the School.

IN his annual report for 1918 as medical officer of health for Wandsworth Dr. P. CALDWELL SMITH gives an interesting summary of that borough's activities in respect of maternity and child welfare. It is not proposed to make reference to the varied work undertaken at the six welfare centres, at the Minor Ailment Department, and through the agency of the health visitors; in the main these are typical of the activities to be found in many of our more vigorous communities. Attention is here specially directed to one item in the scheme of welfare work in Wandsworth—viz., the inclusion of dentistry—in order to illustrate the broader outlook on problems of health now adopted by a constantly growing number of progressive public authorities. Dr. SMITH notes that at one of his centres arrangements had been made with a dental hospital for the treatment of mothers and children sent from the centre. At another, with the coöperation of the London County Council, dental treatment was provided for young children at an inclusive charge of 1s. per child, the fee being reduced to 1*d.* in necessitous cases; it was further proposed to extend the scope of dental treatment to include fillings and extractions, and perhaps at a future date the provision of dentures, for mothers on the register of the centre.

There is real cause for jubilation in the fact that a number of local authorities have already gone far towards a comprehensive scheme of dental supervision for mother and child, while still more are now under weigh and beginning to spread canvas. The provision of dentistry is one of the several activities in which collaboration between the Public Health and the Education Committees of the local authorities concerned is obviously of mutual advantage. The dentist appointed by the two bodies jointly would, as an officer of the Public Health Committee, inspect and give dental advice and treatment to expectant and nursing mothers and to young children up to the age of 5. The work could best be done at, or in close connexion with, welfare centres, and, as the dentist's personality became felt, children would be brought with increasing regularity year after year for dental supervision. With the years would probably come the establishment of a dental workshop, through which the dentist would provide dentures in suitable cases for expectant and nursing mothers and orthodontic appliances for children. By such extension of his sphere of influence the dentist would himself be stimulated into becoming an active missionary for the welfare centre, attracting to it to an increasing extent the class of individual whom the centre should chiefly serve. The advantage to the Education Committee of collaboration would be equally patent. The dentist would continue and extend the work already considerably developed under the ægis of the Board of Education, and in due course would enlarge his sphere beyond the child of the public elementary school to include the adolescent of the secondary and the continuation school. At the same time, his labours for the Education Committee would be lightened to a constantly increasing extent by his previous handiwork for the Public Health Committee at welfare centres. The school dentist would thereby himself lose that sense of futility which oppresses him now, through the knowledge that even when he deals with the child at the beginning of its school career he is already late on the field, and has to put up an unequal fight against dental decay which has entrenched itself during the pre-school years. The work, with its varied types of child, adolescent and adult, with its extension to a greater variety of dental operations than is now afforded by school dentistry, would attract men of good calibre for its own sake, and would lead to more continuous and more contented service.

Annotations.

"Ne quid nimis."

ALCOHOLIC MENINGITIS.

THOUGH signs of chronic meningitis are frequently found post mortem in the bodies of those addicted to alcohol, not until the advent of lumbar puncture was there any clinical evidence of the existence of alcoholic meningitis. Indeed, in this country it is scarcely recognised. At a recent meeting of the Société Médicale des Hôpitaux of Paris Professor Maurice Villaret, M. Fr. Saint-Girons, and M. J. Capoulade reported a case of alcoholic subacute meningitis which is important because of the cogency of the evidence of causation, including the demonstration of alcohol in the cerebro-spinal fluid.

A woman, aged 45 years, a worker in metal, was admitted into the Hotel-Dieu on July 1st, 1919, for severe headache. She was so drowsy that she could not give a history. From her relatives it was ascertained that she was of intemperate habits, but they could not say whether her excesses had recently been greater than usual. Her illness began a fortnight previously by frontal and temporal headache, loss of appetite, and constipation. For several days she was somnolent and replied to questions with difficulty. Her face was congested and without expression, and her eyes were haggard. She lay on her back without the slightest movement and complained only of severe frontal headache. The tendon reflexes were brisk, but the plantar were absent. The pulse was slightly accelerated but regular. In the evening the temperature rose to 102·8° F., and there was a little delirium with incontinence of urine. Meningeal symptoms—slight rigidity of the neck and Kernig's sign—developed. On the 2nd these symptoms increased. The patient became more and more torpid and did not understand questions. The constipation was obstinate and yielded only to enemata, and the tongue was thickly coated. The urine was normal. On the 5th lumbar puncture was performed and yielded slightly cloudy fluid. On the 7th there was retention of urine necessitating catheterisation. The rigidity of the neck, Kernig's sign, the headache, and the delirium persisted. The tendon reflexes were brisk and the pupillary reactions were normal. The temperature did not exceed 100·4°. On the 9th lumbar puncture yielded clear fluid, and on the 10th the patient was much better and gradually regained consciousness. On the 31st she was discharged completely cured. Examination of the cerebro-spinal fluid, removed on the 5th, showed a little floating fibrinous filament. On

centrifugalisation it yielded an abundant white deposit which contained numerous cells, of which 87·3 per cent. were polynuclear and 2·7 mononuclear. There were no microbes. The fluid removed on the 9th contained 40 cells per c.mm., of which 65 per cent. were lymphocytes, 30 mononuclear, and 5 polynuclear. Fluid was also taken on the 17th and gave the bichromate reaction for alcohol. The Wassermann reaction was negative, both for the blood and the cerebro-spinal fluid.

It is generally stated that lumbar puncture is negative in acute alcoholism, but a number of cases to the contrary have been recorded. In 1901 Dufour reported the first case. An alcoholic woman presented intellectual troubles and paralyses, and succumbed to marasmus in spite of antisyphilitic treatment. Lumbar puncture showed abundant lymphocytosis and the necropsy chronic meningitis. Here alcoholism did not appear to be the sole factor, as there was a history of eight abortions, and three days before death the pupils were unequal. In 1909 Henri Claude observed in an alcoholic subject, 19 years of age, well-marked meningeal reactions with xanthochromia and massive coagulation of the cerebro-spinal fluid. M. Villaret has found polynucleosis and hyperalbuminosis of the cerebro-spinal fluid in two out of a dozen cases of delirium tremens. M. Saint-Girons, with the late M. E. Mosny, observed in an alcoholic woman of 56 a meningeal syndrome characterised almost exclusively by headache, mental troubles, and accompanied by transient superabundant polynucleosis of the cerebro-spinal fluid. Recovery was rapid and the Wassermann reaction was negative. The authors suggested that this was not an example of meningitis properly so called, as the symptoms were so slight and passing, but of meningeal congestion, which may be a prodromal stage of meningeal hæmorrhage, a frequent lesion in alcoholics.

THE PATHOGENESIS OF DEFICIENCY DISEASE.

THOSE who have followed, in recent issues of THE LANCET, the careful studies on deficiency disease in the Near East from the pens of Dr. A. D. Bigland and Dr. J. I. Enright will turn with interest to an account given by Lieutenant-Colonel R. McCarrison, I.M.S., of further experiments[1] made by him at the Pasteur Institute of Southern India on the pathogenesis of deficiency disease. His previous investigations were discussed by us in THE LANCET of July 12th, 1919. Colonel McCarrison now deals with the question of the influence of dietaries deficient in accessory food factors on the intestine, and also on the influence of a scorbutic diet on the adrenal glands. His present series of researches have led him to the conclusion that dietaries deficient in accessory food factors give rise in pigeons and in guinea-pigs to congestive and atrophic changes in all coats of the intestine, also to lesions of its neuro-muscular mechanism, to impairment of its digestive and assimilative functions, and to failure of its protective resources against infection. The functional perfection of the gastro-intestinal tract is dependent in a considerable measure on the adequate provision of accessory food factors derived from fresh fruit and vegetables. Further, certain gastro-intestinal disorders, such as chronic intestinal stasis, in the human subject may owe their origin to the long-continued subminimal supply of accessory food factors. Although Colonel McCarrison's experiments were made on birds and guinea-pigs, and although he deprecates any great readiness to apply too directly to the human subject the experimental results of intensive "vitaminic" starvation in the above-named animals, nevertheless he regards the changes he describes as applicable in some degree to man. He contends that it is with sustained subminimal provision of the accessory food factors that the physician is mainly concerned in practice, complete "vitaminic" deprivation being relatively rare, while incomplete "vitaminic" deprivation or subminimal supply of these accessory factors is relatively frequent. Food deficiency also prepares the soil for bacterial growth, and the resulting morbid states will vary with the nature of the organisms which may become implanted upon it. If this knowledge does not enable us to account fully for such gastro-intestinal disorders as mucous disease, cœliac disease, and chronic intestinal stasis, it will, in Colonel McCarrison's opinion, at least help us to a better understanding of their genesis. Another series of experiments were made with guinea-pigs respecting the influence of a scorbutic diet on the adrenal glands. It was found that such a diet caused pronounced depreciation of the functional capacity of the adrenal glands, and that this impairment of adrenal function occurred before clinical evidence of scurvy became manifest. All these contributions to the literature of deficiency diseases are well worth careful study.

[1] Indian Journal of Medical Research, vol. vii., No. 1.

NURSE ANÆSTHETISTS.

IT was stated in a leading article in THE LANCET of Sept. 27th, 1919, that the nurse anæsthetist is accepted in Switzerland. A Swiss operating surgeon writes to tell us how this has come about. The carrying out of narcosis is, he says, left to the nursing sisters in cantonal and communal hospitals because doctors are not available for the purpose. At the smaller communal hospitals the doctor is, as a rule, single-handed, so that the operator has to rely for assistance as well as for narcosis upon the sisters. But even in the larger cantonal hospitals and clinics, at which a number of doctors are available, narcosis is left to the sisters, and the experience with this arrangement has been good. Our correspondent adds that in Switzerland the question whether doctor or nurse is to be preferred for the carrying out of narcosis cannot be answered with a direct yes or no. The doctor, by reason of his education, has a better understanding of the physiology and pathology of narcosis than the sister, and this is certainly not an indifferent matter. But practice plays a large rôle in the giving of anæsthetics, and in this respect the sisters have the advantage, for few Swiss doctors choose narcosis as their career, while the narcosis sisters in hospitals often give, year in year out, a large proportion of the anæsthetics. While it would be a mistake to hand over narcosis to a doctor simply because he is a doctor, the doctor with constant opportunity to keep in practice is, in our correspondent's opinion, to be preferred to the narcosis sister since his scientific knowledge will enable him the better to foresee and avert the accidents which threaten. In Germany, where probationers give most of the anæsthetics, complicated apparatus is used in the hope of mitigating the dangers which arise from lack of practice, but the practised anæsthetist will get on with the simplest methods. Our correspondent adds that he has never seen better narcosis than that of an English colleague who used "a piece of

flannel and a scent bottle." In his own private clinic for many years past a Swiss colleague, a gynæcological specialist, gives ether alone on a Juillard's mask with uniformly successful results. It seems, then, that in Switzerland the doctor anæsthetist is held in proper regard, but that he is rarely available under existing circumstances.

SCIENCE AND INDUSTRY.

THE country under occupation by the Allies in the vicinity of Cologne includes some of the best examples of German chemical industry, and it is interesting to learn that the great factories on the banks of the Rhine have been visited recently by a deputation of British experts. Their report has been issued, and, generally speaking, confirms our previous knowledge of the Germans' activity and their remarkable steadfastness of purpose. It is not so much initiative or ability that they possess as a determination to work out detail and to adapt the lessons of the laboratory to commercial ends. They have turned chemistry to national account, and that is the main lesson of the report to us. In Germany scientific investigation is encouraged, the best advice is gained, and men who are trained to a high level of efficiency are well remunerated. This policy, begun years ago, succeeded, and explains why Germany took a lead over other nations in producing fine and heavy chemicals, pharmaceutical products, and dye-stuffs. The essentials in regard to many processes, naturally enough, are jealously guarded, and presumably it was not the mission of the experts to extract, in many instances, manufacturing secrets. The report is an instructive one, and should have a healthy and stimulating effect on the chemical industries of this country. We are not behind in ability, but we are slow to reap, commercially and nationally, the harvest of our scientific attainments.

AUTOPSIES ON PRISONERS OF WAR.

Professor Rinaldo Pellegrini, of Parma, whose article on simulation in prisoners of war has recently received notice in THE LANCET,[1] describes the results of about 100 autopsies[2] performed by him during his confinement at Celle (Hanover). The excellent water-supply and perfect system of drainage prevented the appearance of the most serious forms of infectious disease. No cases of typhus or cholera occurred. More than a third of the deaths were due to tuberculosis; broncho-pneumonia and lobar pneumonia were fairly frequent, dysentery was rare, there were two cases of malignant growths, two of tuberculous meningitis, and one example of Pott's disease. The œdema of prison camps, though fairly diffuse, was never by itself a cause of death. In almost all the cases, in spite of the youth of the patients, the aortic arch and descending aorta showed patches of arterio-sclerosis, the condition being attributed by Pellegrini to the bodily and mental stress of war and the inanition suffered during imprisonment. Brown colouration of the myocardium, and in more advanced cases brown atrophy, were frequently observed as the result of chronic underfeeding. The same cause accounted for status lymphaticus and the absence of a persistent thymus, which were not infrequently found in autopsies on soldiers at the front. The hilar glands in cases of tuberculosis sometimes showed no specific lesions, this being due principally to the greater facilities for exogenous infection and the more rapid course of pulmonary tuberculosis among prisoners of war. Chiefly as the result of the consumption of war bread, an inferior quality of which was given to the prisoners, gastric catarrh and erosions and chronic enteritis were frequently found.

[1] THE LANCET, Dec. 27th, 1919, p. 1201.
[2] Giornale di Medicina Militare, Jan. 1st, 1920.

PHYSIOLOGICAL RESEARCH AT NAPLES.

THE Zoological Station at Naples has long been known to biologists as a place where the worker is free to carry out researches on his chosen subject independently and without let or hindrance, and with the advice and guidance of the expert staff when desired. Work-tables are rented at the rate of 2500 francs per annum (payable in gold) and as, since 1915, the number of tables let to States has greatly diminished the station is now in need of additional support. Professor E. Gley has recently called attention[1] to the section of physiology and physiological chemistry at the same station, the laboratory equipment of which corresponds to modern requirements of research. The term "Zoological Station," strictly correct under the directorship of Dohrn, should indeed be broadened to "Marine Biological Station," now that physiological study occupies a place as important as does morphological. The utility of researches into comparative physiology is receiving increasing recognition. For biological chemistry, for the study of functional activities, of immunology, and of general physiology it is of the highest importance to be able to experiment with organisations so varied, presenting functions so diverse, as those which inhabit the sea; and the richness and variety of the fauna of the Gulf constitute a chief reason for attracting physiologists to Naples, while in Professor F. Bottazzi the section is fortunate in possessing a director of scientific eminence and polyglot facility. There are, it is true, other marine laboratories in Europe, but with the possible exception of Tamaris-sur-Mer (Var) they lack proper provision for physiological study. At Naples the excellent installations stand ready for use, there is a library of more than 30,000 volumes, with abundant sets of periodicals, and the student will have every help and encouragement.

[1] Revue générale des sciences pures et appliquées.

MERCY FOR THE CHILD.

IN Vienna during the first week of the present year 371 children were born alive and 56 dead, while during the same period 735 deaths were registered, 104 of them ascribed to pulmonary tuberculosis. With 2 deaths to 1 birth the problem of surplus population will not take long to solve itself, even in a capital city. Our Vienna Correspondent last week noted that less than 3 per cent. of the 186,000 school children examined were in a state of good nutrition, and expressed his misgiving at what might happen in the event of epidemic outbreak. In Buda-Pest the situation is still more terrifying, since the already starving war-time population has been almost doubled by the influx of fugitives. Miss J. E. Vajkai, the Hungarian Red Cross delegate, writes from Geneva, under date Jan. 28th, that "the little half-naked children find really every possibility to die." If hunger and cold do not bring immediate release

tuberculosis is ready to do its slower work. Nor is the situation much different in adjacent countries for the American Relief Fund is providing a daily 600-calorie meal for 1,300,000 children in Poland and for 500,000 little Czecho-Slovaks. In Germany, which has already stepped in to offer relief when Vienna was at its last gasp for bread, rickets has endangered the limbs and prospects of a large proportion of its town children, as Professor Engel showed for Dortmund in our issue of Jan. 24th.

The ring of neutral neighbours, unable to bear the story of such misery, has long been offering hospitality to relays of starving children, and already some 30,000 Viennese children have been entertained for a month or more in Switzerland, Holland, Denmark, Scandinavia, and recently—to its infinite credit—in Italy. This country has responded by raising a sum of money, now amounting to nearly £100,000 for starving women and children, and at the suggestion of Sir Thomas Cuninghame an infant welfare supply centre is being organised by the Friends' War Victims Relief Committee in each of the 21 wards of Vienna. All these measures touch as yet but the fringe of the need. But this week the Bradford City Council nearly resolved that the Aliens Act should no longer deter Yorkshire, at all events, from showing mercy to the children of its late enemies. A proposal to offer hospitality for 12 months to 1000 children of school age from the famine areas of Central Europe failed by a small minority in the Council, being replaced by a unanimous vote to subscribe largely to the relief fund.

But Bradford's lead may be followed at once by Manchester, which is to provide for 2000 children if that city accepts its Lord Mayor's guidance. It only remains for every town and village in the country to follow suit after its kind. Who does not give quickly may have no chance of giving at all, for the on-coming of severe weather may at any moment render help too late for many of the victims, and much more difficult for the remainder. To introduce a stranger into the home circle may seem to some a venture of faith, but the visit need not be indefinitely prolonged, for we have high authority for believing that the food-supplies of the world can be increased very rapidly,[1] while there are tens of thousands of families with a working margin, it may be small, but just large enough to take a guest. Voluntary rationing is notoriously difficult, but there is little reason to fear that the automatic reduction of the standard of life caused by one additional mouth will have any unpleasant result. On the contrary, the experience may restore to many citizens that sense of championship of high international ideals which took them into the conflict in 1914.

[1] Sir R. Henry Rew: "Food-supplies in Peace and War," Longmans, Green, and Co., 1920.

THE LANCET, Jan. 3rd and 10th, 1920.

THE Manager will be obliged to readers who have not any further use for their copies of THE LANCET of the above dates if they will kindly return them to him at 1, Bedford-street, Strand, W.C. 2. The postage on the numbers is one penny each. He will be pleased to pay the full price for copies returned, as he is disposing of them again to new subscribers.

CONTROL OF VENEREAL DISEASE:
THE QUESTION OF PROPHYLAXIS.

Memorandum of the Medical Women's Federation.

IN an eight-page foolscap pamphlet issued by the Medical Women's Federation from 9, Clifford-street, London, W. 1, are contained the considered views of the Federation in the form of "Some Suggestions as to the Duty of the State in the Control of Venereal Disease." The conclusion was unanimously reached by the Committee appointed to draw up the Memorandum, which was subsequently approved at an extraordinary meeting of the Federation, that "the chief and most important part of the task with which society is faced is such a reform of our social structure and of our moral habits as will gradually eliminate from society conditions which have led to the prevalence of venereal disease." In regard to prophylaxis, the Federation associates itself with the findings of the Interdepartmental Committee on Infectious Diseases in Connexion with Demobilisation.[1] The Memorandum proceeds:—

"It is obvious from this Report that even under the conditions of discipline of men on active service during war there was no proportionate reduction in the infection rate of those sections of the forces in which the prophylactic packet system was most thoroughly used. In the British Forces the infection rate remained practically the same throughout the war, though during the latter part of it the packet system was very largely used, while in the Australian Forces, where the system was used probably more thoroughly and with more enthusiasm than in any other section, the infection rate was considerably higher at the end than at the beginning.[2] In certain units of the forces, however, where during the recent war the packet system was used with great zeal and energy, the percentage of venereal disease is said to have been afterwards very markedly diminished.[3] It must be remembered that the zeal and energy of the administration was certainly not confined to this one method of stamping out the disease. Also the very fact of the enthusiasm and activity of the officer in command would communicate itself to the whole unit, who would be stimulated to use precautions against the disease. It would be impossible that such personal influence should make itself felt when the system became part of the general civilian sanitary administration. The civil health authorities could not command and control the general population as can be done in the army. The evidence laid before the Interdepartmental Committee on Infectious Diseases in Connexion with Demobilisation points to the conclusion that though 'certain drugs, if properly applied, are efficacious in preventing venereal disease,' yet it is not possible in the army, and would be still less possible among the civil population, to make certain that the drugs were properly or skilfully applied. The immunity obtained by their use would be quite certainly incomplete. We agree with the Committee in its statement that the issue of prophylactic packets 'tends to give rise to a false sense of security, and thus to encourage the taking of risks which would not be otherwise incurred,' and also that 'under any mechanical system which does not give absolute protection, the venereal incidence must be proportionate to the risks taken,' and we hold that if the introduction of such a system leads to an increase in the number of exposures, as would, we consider be practically certain to be the case, it might very easily absolutely increase the spread of the disease.

Prophylactic measures in women.—"In women either prophylaxis or early preventive treatment would be used as a preventive of conception. The complete carrying out of such a system must include the distribution of packets and the placing of posters drawing attention to the system in public lavatories and other suitable places. Whether or no safety could be obtained, promiscuous intercourse would be looked upon as free from risk of infection, and to a great extent free from risk of conception, and as recognised and protected by the State and health authorities, who would become in the eyes of the ignorant the consenting party to their actions. We believe that by no such method can the problem of venereal disease be met, and that a phase of society would be produced as vicious and degenerate as any of which history has record. Safety from infection would not be attained, while moral degeneration and sex excesses would rot the very foundation of society.

[1] Cmd. 322. Prophylaxis against Venereal Disease.
[2] L. W. Harrison: Journ. Roy. San. Inst., 1919, p. 100.
[3] G. A. Reid: Ibid., p. 85.

"We wish to make it quite clear that we are not advocating the retention of disease in order that the fear of infection may deter from promiscuous indulgence. Our point is that promiscuous indulgence would not be safe, while the attitude of the State would encourage the false idea that it was safe and countenanced by the authorities, and so would inevitably lead to increased indulgence and quite possibly to increased disease.

"*Early preventive treatment.*—The provision of early preventive treatment at the public expense at clinics by skilled nurses, male and female, which clinics are to be open at all hours of the day and night, so that sterilisation of the parts may be skilfully carried out within a short time of the act, is also condemned by us, for the same reasons for which we condemn the prophylactic packet system. We protest against the use by the public authorities of any such system, which must lead to the impression that casual intercourse is being made safe and countenanced by the State, and so to the destruction of the sanctions of conduct in sex matters on which our society is based.

"The sale by chemists, to those who wish to purchase them, of calomel ointment or of permanganate of potash solution is a matter with which we have no concern as long as the public is aware that these things are not remedies for venereal disease and that chemists are under a legal obligation not to sell them for the purpose of treatment of these diseases."

The Memorandum concludes with a statement of the constructive policy of the Federation.

The Mansion House Meeting.

A largely attended meeting, convened by the Society for the Prevention of Venereal Disease, was held at the Mansion House on Feb. 5th, the Lord Mayor presiding. Lord Willoughby de Broke, President of the society, moved a resolution to the following effect:—

"It is obvious that the best way of avoiding venereal disease is to abstain from promiscuous sexual intercourse. It is, however, certain that a large number of persons continue, in spite of moral teaching, to expose themselves to risk and so to incur and spread disease amongst the community, the chief sufferers being women and children. Venereal disease has become a menace to national health and prosperity, and in view of the proved fact that infection can be prevented by means of self-disinfection, if properly applied, immediately after exposure to risk, it is necessary to instruct the public as to (*a*) the vital importance of self-disinfection at the time of exposure to risk as a preventive of venereal disease; and (*b*) the methods of application."

Lord Willoughby de Broke contended that the efficacy of early self-disinfection as a preventive of venereal disease had been proved during the war, and he was satisfied that the method could be applied to the civil population. It was, he said, immoral to suppress the truth, and the society over which he presided would not accept the responsibility of concealing from their fellow citizens one of the principal means of stamping out a terrible scourge.

Sir James Crichton-Browne spoke of the grave objections applying to "venereal lavatories," as he termed early treatment centres, where the protection offered came too late to be effective. Such centres would be costly in large towns and impracticable in rural areas. Those attending them would lay themselves open to suspicion and possibly blackmail. The general public should, he said, be informed as to the vital importance of self-disinfection and the means for carrying it out.

Sir E. Ray Lankester said that in order to realise its purpose of diminishing and possibly abolishing the awful damage to life and health due to venereal disease the society intended to spread as widely as possible an effective knowledge of the use of disinfectants for its arrest. They intended to take steps to ensure that it should be an easy matter for anyone to purchase, and to keep in a form ready for immediate use, the two disinfectants approved by authority—namely, permanganate of potash, 5 gr. in half a pint of water, and calomel ointment of the strength of 33 parts by weight of calomel to 67 of a mixture of lanolin and vaseline.

After Sir Arthur Sloggett, Sir G. Archdall Reid, Miss N. March, Dr. A. Mearns Fraser, Miss E. Rout, and Sir W. Arbuthnot Lane had spoken in support of the resolution, it was put to the meeting and carried unanimously.

Directions for Immediate Self-disinfection.

The instructions for immediate self-disinfection, as issued by the Society for the Prevention of Venereal Disease, are as follows in respect of (A) materials required, and (B) methods of application.

A. Materials required.—(*a*) Some cotton-wool. (*b*) A bottle containing a solution of potassium permanganate, 1 in 1000. (Details below.) (*c*) Some 33 per cent. calomel ointment. (Details below.)

B. Methods of application.—I. If exposure to risk takes place out of doors or where complete disinfection is impracticable: (1) Make water. (2) Soak a swab of cotton-wool with the solution of potassium permanganate. Draw back the foreskin, carefully swab the head of the penis and the under surface of the foreskin, especially at the opening of the pipe. These steps must be taken within an hour of exposure to risk. (3) On returning home the sexual organs must be thoroughly washed with soap and water, and 33 per cent. calomel ointment well rubbed into the penis, drawing back the foreskin as in (2) above. This must be done within six hours of exposure to risk.

II. If exposure to risk has taken place indoors, a more complete immediate disinfection should be made: (1) Make water; (2) wash the sexual organs and parts round with soap and water; (3) swab with potassium permanganate solution as in "I"; (4) rub calomel ointment well into the penis.

Note I.—The *careful* swabbing of the penis with the solution of potassium permanganate is the *most important* measure.

Note II.—It is an excellent additional safeguard to apply the calomel ointment *before* intercourse.

III. If exposure to risk has occurred whilst under the influence of alcohol so that the precautions recommended in "I." and "II." have not been promptly taken, the chance of infection may be considerably lessened, though it cannot be removed, by taking as soon as possible all the steps mentioned in "II.," well rubbing the ointment in for ten minutes, and in addition syringing the pipe with potassium or permanganate solution of half the strength recommended for sponging the outside; that is, add an equal quantity of water to the solution, and squirt about a teaspoonful up the pipe with a *small* glass syringe. Do this three times, and then fill the pipe and hold the solution in for two minutes by pinching the lips of the pipe. This method is not nearly as reliable as the *immediate* disinfection, and is useless after 12 hours.

IV. If none of the above precautions have been taken, and there is reason to believe that infection is probable, a doctor should be consulted at the earliest possible opportunity.

Note.—The above methods of self disinfection are only useful for *preventing* the diseases and are *quite useless for cure or treatment* if the diseases have already started.

V. *Prescriptions for materials required.*—(*a*) Potassium permanganate solution: dissolve one five-grain tablet of potassium permanganate in half a pint of water. Four tablespoonfuls of this solution in a small bottle will be enough for one application. (*b*) Calomel ointment (special strength): Calomel 3 parts, lanolin (hydrous) 4 parts, white vaseline 2 parts. Half a small teaspoonful will be plenty for one application.

Education of the Public.

The address given by Sir W. Arbuthnot Lane at the meeting at the Central Hall, Westminster, on Dec. 16th last appears in full in the February issue of *Public Health*. Sir W. A. Lane states that the object of the Society for the Prevention of Venereal Disease is based upon the principle of spreading the truth, the whole truth, and nothing but the truth about venereal diseases, their causation, prevention, effects, and treatment—in other words, "we must educate the public." He goes on to say:—

"It is obvious that in the vast majority of cases chastity is the only way by which venereal diseases can be avoided; yet we recognise that the nature of mankind is such that irregular intercourse will continue to take place in the future, as it has done in the past, and that means must be adopted to reduce infection to a minimum in order that the community shall suffer as little as possible and that these diseases shall be eliminated from amongst us. To attempt to terrorise men and women by depicting the results of these diseases in exaggerated terms is futile, and will have as little effect on them as the fear of an imaginary hell exerts upon an educated people. Should men be impelled to indulge a natural healthy appetite, which varies widely in intensity in different people, such persons should know the most effectual means of avoiding infection and how and when these means should be employed to the best advantage. They should be in possession of the necessary equipment of drugs in a convenient form, so that they may be employed as soon as possible after intercourse.

"The society," he concludes, "hopes soon to have sufficient means at its disposal to spread the knowledge of the preventive measures against these maladies among the members of the lay public, and to reduce and finally exterminate venereal disease."

The Alliance of Honour Campaign.

At a public luncheon given on Feb. 3rd in connexion with the Alliance of Honour the Dean of Lincoln declared that to the wrong administration of the War Office was due much of the evil to be found among the young men who had served in the army. There was nothing in the King's Regulations placing any obligation upon a commanding officer to put down immorality in his command. The time had, he said, come when this state of affairs should be changed, and the Prime Minister was shortly to be approached upon the subject.

TUBERCULOSIS.

Local Hostility to New Sanatoriums.

THE generous offer of a large country house in the Newcastle area for the treatment and training of disabled ex-Service men has recently fallen through on account of local opposition to the men as neighbours. The objections raised by local residents, whenever the establishment of a sanatorium in their neighbourhood is mooted, are so inevitable and have become so stereotyped that their selfishness is apt to be overlooked. Signatures are quickly compiled, "expert" evidence is mobilised, all the arts of obstruction are practised, and a formidable case is presented against the sanatorium, the establishment of which is already hampered by almost countless obstacles. As recently as last November a case of organised local protest against the establishment of a sanatorium was dealt with by a public inquiry, and the evidence against the sanatorium was so standardised, if we may use such a term, and also so illuminated by unconscious humour, that it deserves special notice. The inquiry was conducted by a medical inspector on behalf of the Ministry of Health. On the one side the local council applied for sanction to its purchase of a fine old country house, much used at one time by James I. when hunting in Epping Forest, for the purpose of converting it into an institution for the treatment of tuberculosis. The opposition on the other side was represented by various local interests. The evidence in favour of the establishment of a sanatorium included the statement, from a professor of hygiene in the University of London, who had visited the estate on the previous day, that it was "ideal for the purpose." A characteristic feature of the evidence given on behalf of the protesting residents was the anxiety betrayed lest their district should offer a good enough climate and subsoil for the prospective patients. The estate, it was argued, was in the fog area, both soil and subsoil were unsuitable, and there were no opportunities for expansion at a later date should this be found desirable. Even the dew that waters the area was referred to as being too heavy for consumptives. In fact, a most lugubrious picture was drawn of the local climate, and the anxiety of its residents to save the consumptive from its evil effects was pathetic. We confess that this spirit flourishes to a certain extent on our own lack of exact knowledge concerning the infectiousness of tuberculosis and other problems connected with this disease. Till problems such as those of the subsoil in relation to tuberculosis are solved local residents, medical or lay, and "experts" of any denomination, would do well to refrain from dogmatising.

Krysolgan in Tuberculosis.

Krysolgan is a chemo-therapeutical preparation of gold, introduced in Germany some three and a half years ago. Feldt[1] discusses its present position, remarking that any remedy for tuberculosis must pass two tests: first, it must give rise to focal reaction after intravenous injection, and secondly, such focal reaction must be followed by reparative changes. After these, any variations or intermissions in its action are to be studied. The production of focal reaction seems to have been realised, having been observed in external tuberculous ulcerations. Schnaudigel in a long series of ophthalmic patients reported that krysolgan acted in this respect much like tuberculin, the reaction being either the ordinary inflammatory one, or more frequently "pallor phenomenon." He described a large proportion of cures. Another ophthalmologist wrote similarly, and scientific opinions were, on the whole, favourable; indeed, the diagnostic use of krysolgan was proposed. Bandelier and Roepke used the remedy, especially for laryngeal cases. Combined use is suggested with other agents, e.g., the iodine preparation "alival," and especially tuberculin, the gold preparation being given a day after the tuberculin, when the focus of disease had thus been rendered hyperæmic. Moreover, observation showed that a focal reaction caused by tuberculin could be controlled by a dose of krysolgan, both focal and constitutional signs being mitigated. In this way large doses of tuberculin could be used with impunity. In pyrexial cases Schröder is at present trying small doses of tuberculin, beginning, say, with a thousandth of a milligramme, and simultaneously—that is, on the same days—small doses of krysolgan, from 0·025 g. to 0·5 g. Rapid reduction of the temperature to normal is claimed even in obstinate cases. In all varieties of tuberculosis, however, refractory cases are met with where krysolgan seems without effect. These "gold-refractory" patients, it is suggested, require other specific means in addition: a tuberculin course, or the injection of metallic catalysts, or possibly very small doses of mercury. The author regrets the present scarcity of both of these remedies.

[1] Internationales Centralblatt für die gesamte Tuberkulose-Forschung, Nov. 30th, 1919.

The Work of an Urban Dispensary.

The annual report of the tuberculosis officer for Newcastle-on-Tyne for 1918 shows a decrease in the number of deaths from tuberculosis, most noticeable in the case of non-pulmonary tuberculosis, the death-rate from which was equal to the lowest on record in the city. Investigations into the duration of fatal pulmonary tuberculosis showed that the average was 29 months. The average period between notification and death was 13·6 months. In other words, each patient who died during the year must, on the average, have been ill for 15·4 months before notification. No fewer than 50 per cent. of persons dying from pulmonary tuberculosis had either not been notified before death (18·5 per cent.) or they had died within three months of notification (31·5 per cent.). With regard to family history it was found that among 320 fatal cases there were 132, or 41·25 per cent., with a history of pulmonary tuberculosis in a near relative. The interesting observation was also made that, of those who died of pulmonary tuberculosis, the individuals with a history of phthisical parentage died at a considerably earlier age than others without this history. Evidence of the growing usefulness of the dispensary is found in the increasing number of attendances, the figures being 11,517 as compared with 9286 in 1917 and 7758 in 1916. The work of the dispensary nurses is also reviewed, and the fact noted that when tubercle bacilli have been found in the sputum the patient is visited at least once a month with a view to medical instructions being carried out, and spread of infection to other members of the family being prevented. Of the 1080 sputums examined at the dispensary only 233 were found to contain tubercle bacilli.

A Sanatorium for Merchant Seamen.

At a recent meeting of the Court of Governors of the Seamen's Hospital Society the Committee reported that in connexion with the new hospital for tropical diseases at Endsleigh-gardens, N.W., an effort was being made to establish a sanatorium for seamen on the Hampshire Downs. The percentage of cases of tuberculosis occurring among seamen is not unduly high, but the circumstances of the sailor's calling render it difficult for him to await his turn on the long list of those seeking admission. In the meantime he is tempted to put to sea again with the disease

still active, when the conditions on board tend to aggravate the disease and to make him a source of danger to his shipmates. An initial grant has been allocated by King George's Fund towards the purchase of Bramshott Place, Hants, approved for the purpose by the Ministry of Health. A sum of £70,000 is needed for the establishment of the sanatorium, of which the P. & O. Company and its associates have promised £10,000 and Messrs. Furness, Withy and Co. £2500. The office of the fund is at 122, Leadenhall-street, London, E.C. 3.

Influenza in Tuberculous Patients.

The outstanding feature of the November number of the *American Review of Tuberculosis* is a paper by Professor Maurice Fishberg on influenza and tuberculosis. He writes: "I have not met a single case of phthisis during the past year which could be ascribed to have followed influenza." After a careful review of his own and others' experience, he maintains that epidemic influenza bears no ætiological relationship to tuberculosis, and that dormant tuberculous lesions are not stirred into activity by influenza. This disease does not run a more acute, severe, or fatal course in the subjects of tuberculosis than in healthy persons, and, as vital statistics and sanatorium reports show, the mortality from tuberculosis has not increased during the past year, although influenza has been raging. He adds: "The pulmonary sequelæ remaining after influenza are almost without exception non-tuberculous in character, and do not require the treatment accorded to phthisical patients."

The *Paris Médical* for Jan. 3rd is devoted to a series of papers on tuberculosis, including a retrospect and a forecast by Dr. P. Lereboullet and Dr. L. Petit. In a review of the relation of influenza to tuberculosis, Dr. M. P. Ameuille comes to the conclusion that, in the course of the last epidemic, influenza rarely attacked the tuberculous, and when they contracted influenza this disease ran a peculiarly mild course. The opinions he expresses as to the effect of influenza on the further course of tuberculosis are guarded. A paper by Dr. C. Sabourin deals with menstruation in relation to tuberculosis.

The *Zeitschrift für Tuberkulose* for December, 1919, contains a paper by Dr. E. Dorn, whose findings with regard to the relation of influenza to tuberculosis are in close accord with Professor Fishberg's. The writer found that among 184 tuberculous patients at the Wilhelmsheim Sanatorium, 111, or 60 per cent., contracted influenza, but only in 5, or 4·5 per cent., was the pulmonary disease temporarily or permanently aggravated. Another curious observation was the reaction of the sanatorium patients to different waves of the epidemic. In the summer of 1918 more than half the patients contracted influenza. The second wave, which swept over the neighbourhood in the autumn and winter of 1918, did not affect a single patient, although the virulence of the influenza was great and the opportunities for infection by visitors were numerous. The writer admits that the processes by which this evident immunity was acquired are obscure.

AID-POSTS FOR EPIDEMICS IN DURHAM.—The county medical officer for Durham has issued a memorandum, in anticipation of the possibility of another epidemic of influenza, urging the appointment of more district nurses and the organisation of emergency home helps. In order to obviate the difficulty of getting into touch with cases needing assistance he suggests the formation of emergency committees, and the establishment of aid-posts at convenient centres, as in Sunday-school rooms, council offices, and welfare centres. The emergency committee could meet at the centre to discuss the position from day to day if necessary. A responsible person should attend twice daily to take messages left by doctors and others requiring help, and to deal with the cases on the best lines possible. Stores of nursing requisites should be kept at the aid-posts, such as bed-pans, mackintoshes, feeding cups, pneumonia jackets, dried milk, Benger's food, and other invalid material. Voluntary workers would be of great assistance at these aid-posts in dealing with the stores and food. He suggests, further, that it would be a good plan to keep a reserve of nursing requisites at isolation and union hospitals for use in epidemics.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Postal Services in Dublin: Medical Practice Embarrassed.

THE telephone service in Dublin has been thoroughly unsatisfactory, and is probably worse than in any city of importance in the kingdom. Steps have now been taken to reduce the postal service to the same level. Prior to the war we had a good postal service, but naturally during war-time medical practitioners had to put up with many inconveniences. They, however, were trivial compared with what has to be suffered under the new arrangements. Almost all night work is to cease at the post offices. Two consequences of pressing importance to medical men result. One is that they cannot get their morning letters before the hour at which they usually begin their morning round. The other is that by the time they have finished their day's correspondence the last collection for the night has been made. A medical man is therefore forced to make his appointments two days at least ahead, and if he finds it necessary to alter an appointment he can only do so by telegraph. As an example of the new system, suppose a patient in Dublin writes to a medical man on Monday asking for an early appointment. The letter will be delivered some time on Tuesday. The doctor sends his reply on Tuesday evening, and it will reach his patient on Wednesday afternoon. The earliest appointment cannot be before Thursday. The cross-Channel service is equally bad. The postal authorities now demand an interval of 12 hours in the case of the day mail and three in the case of the night mail between the posting of a letter and its despatch from Dublin. Business must suffer, but medical men feel that lives will be lost.

Hospital Strike at Carrickmacross.

The nurses of Carrickmacross Fever and General Hospital in co. Monaghan have struck work for a minimum salary of £52 per annum, with subsistence allowance of £76. It is said that the patients are without nursing attendance, and that one admitted since has died, though this may in no way be connected with the strike. Appeals to other hospitals have brought no response up to the present—or so I am informed—a circumstance that may be due simply to the scarcity of nurses. Railway men, miners, and dockers, when on strike, get more sympathetic treatment from the press than nurses or doctors.

Coleraine Cottage Hospital.

At the annual meeting of Coleraine Cottage Hospital held on Feb. 6th it was reported that the work of the institution was steadily increasing, there being in 1919 as many as 261 in-patients and 179 out-patients. Financially, the income exceeded the expenditure during 1919 by £11 19*s.* 9*d.* The Coleraine War Memorial Committee has now £1700 in hand, and the chairman, at the annual meeting of the cottage hospital, suggested that it might be handed over as the nucleus of a fund for the erection of a war memorial hospital for Coleraine.

Epidemic Disease in Belfast.

It is satisfactory to know that scarlet fever and measles are quietly subsiding. As the old pathologists used to explain, the virus has "fermented itself out," but notification, isolation, and disinfection have not had a triumph in stopping the epidemics in Belfast.

Ulster Medical Society.

At a recent meeting of this society the following resolution, proposed by Professor J. A. Lindsay and seconded by Dr. J. McCaw, was passed unanimously:—

"That in the opinion of the Fellows and Members of the Ulster Medical Society it is essential that a clinical examination in ophthalmology, conducted by ophthalmic surgeons, be part of the final qualifying examination for medical degrees and diplomas as heretofore in all Ireland. This seems absolutely necessary if ophthalmology is to retain the position its importance entitles it to in the education of the future medical profession of this country."

Feb. 10th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

A Night Medical Service in Paris.

M. Roux, Prefect of Police, has just issued an order concerning the reorganisation of the medical service in Paris at night. There is to be a service of 30 doctors appointed by the Prefect. The duration of their appointment will be three years at the most, with fixed annual pay of 3000 francs, and the sum of 50 francs for each night of actual work to the five medical men detailed as substitutes. Paris is divided into five sections, in each of which a doctor is permanently on duty from 10 P.M. till 7 A.M. from Oct. 1st to March 31st, and from 10 P.M. to 6 A.M. from April 1st to Sept. 30th. The site of his activities is to be a central police station, where a room containing a bed will be available. The call for the doctor will be made to the nearest police station by the patient; thence a telephone message will be sent to the chief of the municipal police, who will send a motor-car to take the doctor to the patient and then on to the medical station. Each car is furnished with a case containing urgent first-aid appliances, such as dressings, cachets, ampoules, and a small collection of syringes and sterilised instruments. The medical service is so organised that the turn of each doctor comes round once in six days. The labour cases will be catered for by the midwives attached to the night medical service, and the tariff for their visits is fixed as follows: simple visit, 15 francs; simple labour, 35 francs; twins, 60 francs. If a midwife has to resort to a doctor for help she will be able to requisition his services on the lines indicated above.

Overcrowding in Maternity Hospitals.

The rise in the number of births, from an average of 167 a day in December to 203 a day in the first fortnight of January, has occasioned much overcrowding in the maternity hospitals. The fact is aggravated by an evident desire for economy on the part of certain members of the population. One distressing consequence of the situation must unfortunately be chronicled; puerperal fever has recently appeared at several places, and its incidence must be attributed to overcrowding, inadequate equipment, and lack of stores. The only way likely to be efficacious at the moment to prevent its extension is to supply such help to lying-in women as will enable them to remain in their own homes. M. Autrand, Prefect of the Seine, has formed this opinion, and after consultation with the Directeur de l'Assistance Publique he has under consideration the allocation of a new bounty of 50 fr., which would be additional to the sum usually given. Moreover, the regular fee paid to midwives for conducting a labour at the patient's home would be raised from 50 to 70 fr.

Excess Profits Tax Applied to Medical Men.

The Treasury has declared its intention of enforcing on medical men the war profits tax paid by business men and manufacturers on profits made since 1914 in excess of the average of the five years preceding the war. At Marseilles, in spite of protests, the tax has already been imposed. Paris doctors protested in advance, but a test case has resulted in the decision that medical men are subject to the excess war profits tax.

Legacies for Successful Research.

Under the will of Me. Audiffred a prize of 24,000 fr. was offered for the discovery within 25 years from April 2nd, 1896, of a curative or preventive medicine against tuberculosis which should be absolutely certain. The Academy of Medicine has not hitherto felt sure that anything fulfils these conditions. The interest on the capital has not been distributed, though this could have been done, doubtless because it is too small at 3 per cent. to be of much use. If the prize is not won by April 2nd, 1921, the sum of 24,000 fr. and the accumulated interest thereon will become the property of the Academy. The present intention is to found a new prize with the same object, but this time to distribute the interest in annual grants to research workers in accordance with the scheme of the Academy of Science for the Breant prize for research into Asiatic cholera. The interest will be larger because the Academy, having become the owners of 50,000 fr. through accumulation of interest, will sell the present securities and will be able to get 6 per cent. for their money. This will mean 3000 fr. for distribution every year.

Encephalitis Lethargica.

Cases of encephalitis lethargica are apparently becoming more numerous and the area of distribution of the disease is growing larger. Cases are reported from Versailles, Lille, Toulouse, Châlons-sur-Lâone, Vienna, and Mulhouse. M. Remlinger has reported cases occurring in Algiers and Tunis. They appear to be characterised mainly by the long duration of the period of somnolence. The mortality is everywhere about 25 to 30 per cent.

Feb. 9th.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Effect of Housing and Sanitary Conditions on Maternity and Child Welfare in India.

A CORRESPONDENT of the *Pioneer* makes some pertinent remarks on this subject. On all sides schemes are being promoted to improve the condition of Indian mothers and to provide skilled attendance at child-birth. But their antenatal conditions cannot be ameliorated until the housing conditions have been improved. Improvement is not likely to be rapid, since the housing of menial classes, even of those employed by Government mills, railways, &c., under European or educated supervision, is still very bad. The employees are lodged in rooms 10 ft. by 10 ft., and more often than not built back-to-back to save a party wall. The usual type of house has in front a useless 5 ft. verandah and a zenana courtyard surrounded by a 7 ft. wall, in which is also housed the family's latrine. This arrangement effectively prevents the entrance of light and air into these cells, the condition of which, with neither light nor through ventilation, is anything but conducive to general health of a family. Improvement of antenatal conditions for an expectant mother is thus impossible. It is useless under these conditions of housing to talk of inculcating domestic sanitation and hygiene; nor, considering the dirty earthen floors and the cells used as living rooms, can infantile mortality be reduced from the appalling figure at present prevailing among the poorer Indian classes.

Bacteriology in India.

From the annual report of the Bacteriology Laboratory, Muktesar, we learn that the total receipts from the sale of the laboratory products amount to Rs. 3,42,402–11–0, and that the expenditure has been Rs. 4,37,712–13–4. The receipts include arrears of the previous year, and bills amounting to Rs. 67,890–1–3 still waiting payment have to be carried over to next year's account. Had not the vaccines and serums supplied to the military authorities been free of charge Rs. 1,38,330–2–9 would now have been available towards their production on a large scale. The result should be greatly to reduce the menace of cholera to troops on service, and we may wonder why this method was not put into practice in the recent operations on the frontier.

An All-India Chemical Service.

A Committee has been appointed to deal with the question of an All-India Chemical Service. Details are now available which show that, unsatisfactory as is the existing position from the point of view of the employer, it is even less satisfactory from that of the employee. The inability of local governments to judge the scientific officers which they employ, or to replace them when they leave or fall ill, has been pointed out. The small but not unimportant results achieved, with the help of the Indian Munitions Board, in marshalling the scientific forces of the country threw into contrast the vast field of possibilities in which no consistent policy is

developing economic assets. However, certain more or less successful attempts have been made from time to time to build up an organisation of officers for scientific work. Instances such as the Geological Survey of India and the Indian Agricultural Service, prove by their success the advantages of their systems, though the systems of these two departments differ radically from one another. The importance of organising scientific workers is now widely recognised, and the question for consideration of the Government of India is the form of organisation best suited to Indian conditions. A scheme for All-India services as a basis of scientific organisation has been put forward by the Indian Industrial Committee. The Government of India have decided to deal in the first place with the case of officers employed under Government as chemists, and have, with the concurrence of the Secretary of State, appointed a Committee with the following terms of reference:—

1. To consider whether an All-India Chemical Service is the best and most suitable method of overcoming the difficulties and deficiencies pointed out by the Indian Industrial Commission.
2. In the event of the Committee approving the principle of an All-India Service, to devise terms of recruitment, employment, organisation, to indicate the extent to which chemists already in Government employ should be included in that service, and to suggest what should be the relations of the proposed organisation with the public and with Departments of the Government of India and of local governments.
3. In particular to frame proposals for the location, scope, and organisation of institutions for chemical research.

Professor J. F. Thorpe, professor of organic chemistry in the Imperial College of Science and Technology, London, has been appointed President, and Dr. J. L. Simonsen, F.I.C., forest chemist, Dehra Dun, has been appointed secretary of the Committee.

URBAN VITAL STATISTICS.

(Week ended Feb. 7th, 1920.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality, which had been 15·6, 15·3, and 15·9 in the three preceding weeks, was again 15·9 per 1000. In London, with a population slightly exceeding 4,000,000 persons, the annual death-rate was 17·2, or 0·4 per 1000 above that recorded in the previous week, while among the remaining towns the rates ranged from 6·4 in Rotherham, 7·6 in Gloucester, and 8·1 in Swindon, to 22·1 in Liverpool, 22·6 in Grimsby, and 25·2 in Great Yarmouth. The principal epidemic diseases caused 383 deaths, which corresponded to an annual rate of 1·2 per 1000, and comprised 97 from diphtheria, 96 from whooping-cough, 90 from measles, 63 from infantile diarrhœa, 34 from scarlet fever, and 3 from enteric fever. Measles caused a death-rate of 2·3 in Grimsby; whooping-cough of 1·3 in West Ham, 1·4 in Leyton, 1·6 in Grimsby and in Birkenhead, and 1·7 in West Hartlepool; and diphtheria of 2·5 in Hornsey. The 98 deaths from influenza were 32 in excess of the number in the previous week, and included 20 in London, 11 in Leeds, 10 in Liverpool, 9 in Birmingham, and 4 each in Manchester, Bradford, and Sheffield. There were 2487 cases of scarlet fever and 2014 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 2550 and 2008 respectively at the end of the previous week. The causes of 39 deaths in the 96 towns were uncertified, of which 10 were registered in Birmingham, 4 in London, and 3 in Sunderland.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at 2,400,000 persons, the annual rate of mortality, which had been 16·1, 15·3, and 15·9 in the three preceding weeks, fell to 14·7 per 1000. The 334 deaths in Glasgow corresponded to an annual rate of 15·7 per 1000, and included 6 each from diphtheria and infantile diarrhœa, 3 from scarlet fever, 2 from whooping-cough, and 1 from measles. The 83 deaths in Edinburgh were equal to a rate of 12·7 per 1000, and included 2 from diphtheria, and 1 each from scarlet fever and infantile diarrhœa.

Irish Towns.—The 153 deaths in Dublin corresponded to an annual rate of 19·2, or 3·4 per 1000 above that recorded in the previous week, and included 5 from whooping-cough, 3 from infantile diarrhœa, 2 from diphtheria, and 1 from measles. The 146 deaths in Belfast were equal to a rate of 18·4 per 1000, and included 12 from measles, 6 from scarlet fever, and 2 each from enteric fever, whooping-cough, diphtheria, and infantile diarrhœa.

The Services.

THE HONOURS LIST.

THE following awards to medical officers, for valuable services rendered in connexion with military operations in North or South Russia or in Persia are announced:—

C.M.G.—Capt. (acting Lt.-Col.) D. C. L. Fitzwilliams, R.A.M.C. (T.F.).

C.B.E.—Temp. Capt. (acting Maj.) E. S. Marshall, M.C., late R.A.M.C.; Col. G. St. C. Thom, C.B., C.M.G., late R.A.M.C.; Lt.-Col. (temp. Col.) C. H. Bowle-Evans, C.M.G., I.M.S.

O.B.E.—Maj. (acting Lt.-Col.) A. W. A. Irwin, R.A.M.C.; Maj. (acting Lt.-Col.) J. M. B. Rahilly, R.A.M.C.; Capt. (acting Lt.-Col.) T. H. Richmond, R.A.M.C. (T.F.); Capt. (acting Maj.) C. G. G. Keane, R.A.M.C.; Temp. Capt. (acting Maj.) A. H. Macklin, R.A.M.C.; Capt. (acting Lt.-Col.) J. F. W. Sandison, M.C., R.A.M.C. (S.R.); Temp. Capt. (acting Maj.) T. V. Somerville, M.C., R.A.M.C.; Capt. T. A. Butcher, R.A.M.C. (S.R.); Maj. T. S. Dudding, R.A.M.C.; Maj. (acting Lt.-Col.) W. Lapsley, I.M.S.

To be Brevet Major.—Capt. H. C. Rook, R.A.M.C. (S.R.); Capt. C. S. P. Hamilton, D.S.O., R.A.M.C.; Capt. (acting Lt.-Col.) H. R. B. Gibson, I.M.S.

D.S.O.—Maj. A. Irvine-Fortescue, R.A.M.C.

M.C.—Capt. J. J. Magner, R.A.M.C.

BROUGHT TO NOTICE.

The names of the following medical officers are brought to notice for valuable and distinguished services rendered in connexion with operations in North or South Russia or in Persia. All are of the R.A.M.C. except where otherwise stated:—

Capt. F. B. Beatson, I.M.S.; Lt.-Col. (temp. Col.) C. H. Bowle-Evans, C.M.G., I.M.S.; Temp. Lt. F. C. S. Bradbury; Capt. T. A. Butcher; Maj. A. Cameron, I.M.S.; Temp. Capt. (acting Maj.) T. E. Coulson; Maj. T. S. Dudding; Capt. C. M. Finny; Capt. (acting Lt.-Col.) D. C. L. Fitzwilliams; Capt. (acting Maj.) H. R. Friedlander; Capt. (acting Lt.-Col.) H. R. B. Gibson, I.M.S.; Temp. Capt. (acting Maj.) R. T. Grant; Maj. (acting Lt.-Col.) H. Hallilay, I.M.S.; Capt. W. E. Hodgins; Capt. J. Hope; Capt. (acting Maj.) L. E. Hughes, M.C.; Temp. Capt. (acting Lt.-Col.) E. R. Hunt; Maj. A. Irvine-Fortescue; Maj. (acting Lt.-Col.) A. W. A. Irwin; Temp. Capt. (acting Lt.-Col.) R. Jamison; Maj. (acting Lt.-Col.) G. A. Jolly, I.M.S.; Temp. Capt. N. Joshi, I.M.S.; Capt. (acting Maj.) C. G. G. Keane; Capt. T. Kennedy; Temp. Capt. R. N. Khosla; Maj. (acting Lt.-Col.) W. Lapsley, I.M.S.; Temp. Capt. (acting Maj.) A. H. Macklin, M.C.; Temp. Capt. (acting Maj.) E. S. Marshall, M.C.; Temp. Capt. P. N. Mitra, I.M.S.; Maj. (acting Col.) E. L. Moss, C.M.G., M.C.; Temp. Capt. J. H. Oonawala, I.M.S.; Maj. (acting Lt.-Col.) J. M. B. Rahilly; Temp. Capt. B. S. Rao, I.M.S.; Capt. (acting Lt.-Col.) T. H. Richmond; Capt. (acting Lt.-Col.) J. J. D. Roche; Capt. (acting Lt.-Col.) J. F. W. Sandison, M.C.; Capt. J. L. Schwartz; Temp. Capt. R. L. Sinclair; Temp. Capt. M. A. Singh, I.M.S.; Temp. Capt. (acting Maj.) T. V. Somerville, M.C.; Lt. (Temp. Capt.) G. E. Spicer, M.C.; Col. G. St. C. Thom, C.B., C.M.G.; Capt. M. D. Vint; Temp. Capt. (acting Maj.) J. D. Watson, M.C.; Capt. (acting Lt.-Col.) J. B. A. Wigmore.

The following, also of the R.A.M.C. except where otherwise stated, have been brought to notice for valuable services rendered whilst prisoners of war or interned:—

Lt.-Col. E. F. E. Baines, I.M.S.; Capt. R. C. Clifford, D.S.O., M.C., I.M.S.; Lt.-Col. P. H. Collingwood; Temp. Capt. H. M. Gilbertson; Temp. Capt. A. J. Gilfillan; Temp. Capt. R. W. Hodgson-Jones; Temp. Capt. J. L. Jackson; Capt. W. H. R. McCarter; Temp. Capt. A. T. I. Macdonald; Capt. S. S. Meighan; Capt. L. Murphy, D.S.O.; Maj. W. R. O'Farrell; Capt. C. E. Redman; Maj. J. Startin; Capt. A. Sutcliffe; Maj. W. I. Thompson; Temp. Capt. E. A. Walker; Capt. W. Warburton.

A communiqué has been issued from the War Office, dated Feb. 9th, containing a list of names, which will not be gazetted, brought to the notice of the Secretary of State for War for valuable services rendered, mostly in the United Kingdom, in connexion with the war. The names of the following medical men appear in the list:—

Lt. E. J. Bader, S.Afr.M.C.; Dr. G. Badgerow; Temp. Capt. E. B. Barton, R.A.M.C.; Capt. A. S. Barnes, R.A.M.C. (T.F.); Mr. W. H. Beaumont; Capt. E. C. Bradford, R.A.M.C. (T.F.); Maj. W. Bruce, O.B.E., N.Z.M.C.; Temp. Maj. A. Cambell, R.A.M.C.; Dr. E. H. Colbeck, O.B.E.; Mr. W. H. Cooke; Mr. C. Curd; Dr. M. B. Ferguson; Capt. E. E. W. Fisk, S.Afr.M.C.; Mr. R. F. Flood; Capt. C. R. Girdlestone, R.A.M.C. (T.F.); Temp. Capt. J. Graham, R.A.M.C.; Dr. A. S. Griffith; Mr. J. M. Harper; Dr. H. Henderson; Dr. A. Hodgson; Dr. L. Kidd; Dr. P. King; Maj. (acting Lt.-Col.) W. Kirkpatrick, R.A.M.C. (T.F.); Mr. F. Lace; Temp. Capt. A. W. Macgregor, R.A.M.C.; Dr. G. J. K. Martyn, Dr. E. Montgomery; Mr. J. M. H. Munro; Maj. (acting Lt.-Col.) W. Murray, R.F.A. (temp. Maj., R.A.M.C.); Maj.-Gen. Sir W. W. Pike, K.C.M.G., D.S.O., A.M.S.; Temp. Capt. A. H. Priestley, R.A.M.C.; Maj. A. G. Reid, R.A.M.C.; Mr. C. W. C. Robinson; Mr. G. J. Scale; Capt. A. L. Singer, N.Z.M.C.; Dr. C. Sturm; Temp. Capt. J. H. K. Sykes; Dr. E. C. Thompson; Lt.-Col. and Bt. Col. S. J. Thomson, R.A.M.C.; Temp. Capt. A. H. Ward, R.A.M.C.; Dr. A. M. Watson; Capt. R. W. F. Wood, N.Z.M.C.; Temp. Capt. A. E. Wynne, R.A.M.C.

ROYAL NAVAL MEDICAL SERVICE.

Temporary Surgeon-Lieutenants transferred to the permanent list of Surgeon-Lieutenants: R. Buddle, H. L. Douglas, H. A. L. Guthrie, J. F. Ainley.

ROYAL ARMY MEDICAL CORPS.

Lieut.-Col. G. S. Crawford and Major M. G. Dill retire on retired pay.

Major W. Byam to be temporary Lieutenant-Colonel whilst specially employed.

The undermentioned Majors relinquish the acting rank of Lieutenant-Colonel: G. R. Painton, (Brevet Lieut.-Col.) C. W. Holden.

Temp. Capt. P. J. Lane relinquishes the acting rank of Major.

Capt. J. E. Rusby resigns his commission.

Capt. P. C. Field is restored to the establishment.

Captains to be Majors: F. R. Coppinger, A. C. Hammond-Searle, J. E. Ellcome, G. J. Keane, (Bt. Major) H. H. Blake, R. M. Dickson, (Acting Major) F. Worthington, A. L. Stevenson, B. Varvill, (Acting Major) J. W. Houston, (Bt. Major) A. Shepherd, W. J. Dunn, F. B. Dalgliesh, (Acting Major) S. G. Walker, C. E. L. Harding, (Acting Major) A. L. Foster, C. M. Rigby, (Acting Major) A. G. Wells, (Bt. Major) A. E. G. Fraser, W. H. S. Burney, T. E. Eves, L. Murphy, A. H. T. Davis, J. S. McCombe, W. J. Tobin, (Acting Major) C. McQueen, R. O'Kelly.

Temp. Capt. J. E. Thompson to be acting Major.

Lieutenants (temporary Captains) to be Captains: C. O. J. Young, R. N. Phease, C. B. C. Anderson, P. E. D. Pank, G. Moulson, W. J. F. Craig.

Captains resigning their commissions: J. W. O'Brien, W. Moodie.

Captains seconded for service under the Colonial Office: C. D. M. Buckley, W. C. Hartgill, T. J. L. Thompson.

Temp. Lieut. H. Abernethy to be temporary Captain.

Officers relinquishing their commissions:—Temporary Majors retaining the rank of Major: A. T. Duka, E. Swainston, W. Pearson. Temp. Capts. M. Murphy (on transfer to the Indian Medical Service), A. Jones (granted the rank of Lieutenant-Colonel), (Acting Major) H. B. G. Russell (granted the rank of Major), (Bt. Major) R. Bruce-Low (retains the Brevet rank of Major). Temporary Captains retaining the rank of Captain: E. N. Glover, J. W. Robertson, M. J. Murray, J. D. Doherty, W. G. Macdonald, R. F. Lunn, A. S. Morley, C. R. Smith, S. W. Allworthy, A. H. D. Smith, H. W. Bennett, F. O'B. Ellison, J. R. O'Brien, W. J. Oliver, C. F. Constant, A. V. Dill, W. Murphy, A. E. Clarke, H. F. Penman, A. M. Malcolmson, A. Trower, H. W. Hay, H. Coppock, H. A. Richards, G. Millar, J. A. F. Hatch. Temporary Honorary Captains retaining honorary rank of Captain: V. Ricci, A. H. Good.

GENERAL RESERVE OF OFFICERS.

J. W. O'Brien, W. Moodie, and J. E. Rusby, late Captains, R.A.M.C., to be Captains.

SPECIAL RESERVE OF OFFICERS.

Officers relinquishing their commissions:—Capt. A. G. S. Wallace (granted the rank of Major). Captains retaining the rank of Captain: J. P. Broom, H. M. Wharry, E. D. Roberts, H. J. Rice, D. M. Jones, W. H. Duff, P. Charnock, A. A. Fyffe, J. J. Landers, P. V. Anderson. Lieut. C. L. Hewer (retains the rank of Lieutenant).

TERRITORIAL FORCE.

Capts. (acting Majors) L. J. E. McHugh, F. R. Humphreys, A. E. P. McConnell relinquish the acting rank of Major on ceasing to be specially employed.

Capt. C. P. C. Sargent is restored to the establishment.

Capt. H. B. Porteous is seconded for service with the R.A.F.

ROYAL AIR FORCE.

Medical Branch.—Capt. F. C. Kempson to be acting Major whilst employed as Major.

Flight Lieut. A. S. Glynn to be acting Squadron Leader whilst employed as Squadron Leader.

The undermentioned Captains are transferred to the unemployed list:—C. R. M. Pattison, J. Souter, S. R. E. Davies, T. C. Backhouse, W. Enraght, J. E. Lascelles, H. W. Pigeon.

Dental Branch.—Capt. W. J. Singleton and Lieut. (acting Capt.) G. W. Allen are transferred to the unemployed list.

SUSSEX THROAT AND EAR HOSPITAL.—The new buildings of the Sussex Throat and Ear Hospital in Church-street, Brighton, erected in 1898, have outgrown their requirements—at least, for out-patients, who now number over 400 a month. Last year the total was 4809, an ever increasing number. Needless to say, the resources are taxed to the utmost, and the Management Committee is appealing for increased annual assistance, and also for donations towards erecting an additional wing. It would seem also that the in-patient department must be severely taxed in that there were 469 cases during 1919, as against 403 in 1918, the beds numbering 22. No death has occurred in the institution for two years.

Correspondence.

"Audi alteram partem."

IS THERE A PARA-SCARLET FEVER?

To the Editor of THE LANCET.

SIR,—Dr. C. R. Box, in his letter in your issue of Jan. 31st, asks for an expression of experience as to the character of the cases of scarlet fever during the present prevalence. In respect of the occurrence of relapses, real or apparent, my experience at this hospital has been that they have not been more frequent than usual. When rubella is epidemic certain cases are invariably passed through the receiving rooms of fever hospitals as mild scarlet fever; consequently rubella breaks out in the wards amongst the scarlet fever patients, and some of the rubella cases erroneously admitted catch scarlet fever. But rubella has not been prevalent in London lately, nor is it now, so that such untoward results are not happening. The cases, therefore, have presumably been cases of scarlet fever. Until recently the bulk of the cases have been of a mild character, as Dr. Box states. But since the end of December there has been an increase in the proportion of cases of a severe type.

Since Dr. C. Dukes drew attention to what he believed to be another infectious and epidemic disease, the "fourth disease," now close on 20 years ago, I have been on the look-out for it; but I have never been able to satisfy myself of its occurrence. Scarlet fever is clinically, and also epidemiologically, a very variable disease, with aberrant forms—namely, without pyrexia, without a rash, without peeling, with little or no sore-throat, &c.; and as has been pointed out by Dr. F. G. Crookshank in a very recent paper read before the Epidemiological Section of the Royal Society of Medicine, it is just in epidemic times that atypical cases of epidemic diseases are brought to light. Scarlet fever is so widely and continuously prevalent a disease, and its mode of dissemination is of such a kind, that it should be possible to prove the existence of a para form (if it exists more than sparsely), from clinical observation—that is, if it be the case that the ordinary and the paraform do not protect against one another.

By the way, is it asking too much to appeal to Dr. Box and other writers to discard the term "German measles"? The disease is neither German nor measles, as the latter word is now understood. The late Local Government Board lost a splendid opportunity of getting rid of this misnomer a few years ago, when it issued certain administrative orders relating to measles.

I am, Sir, yours faithfully,

E. W. GOODALL.

North-Western Hospital, Hampstead, N.W., Feb. 7th, 1920.

PHYSIOLOGICAL PRINCIPLES IN TREATMENT.

To the Editor of THE LANCET.

SIR,—I much appreciate the kindly and sympathetic review of the fourth edition of my "Physiological Principles in Treatment" which appeared in your columns on Jan. 21st. May I, however, reply to two minor criticisms contained therein? The metaphor of "potassium iodide ferreting out the toxins which lurk in lymph spaces"—which I quoted from Dr. Leonard Williams—may be more vivid than precise, and yet the meaning seems clear. The problem is to explain how iodide lowers blood pressure in certain cases of hyperpiesis although it has no effect on normal blood pressure. The suggestion is that it may help to eliminate pressor toxins as it does the syphilitic toxins. The work of Barger and Dale has proved the existence of such pressor toxins.

With regard to the remark that "it is not the author's fault that acidosis has jumped off on another track (and perhaps run away altogether) since he wrote his account of it" somewhat puzzles me; and so it does two well-known physiologists whom I have consulted. The only generally accepted addition to our knowledge

on the subject is, I understand, Professor Haldane's disproof of physiological acidosis occurring at high altitudes. As I stated, my account of the newer developments was based on Dr. E. P. Poulton's Goulstonian lectures, which were published in your columns about June, 1918, and Dr. Poulton is himself an original investigator on the subject. It is true that hypotheses concerning acidosis follow one another almost as swiftly as the editions of an evening newspaper, but I think it is of doubtful utility to burden the general practitioner with theories which are still in the controversial stage and which have not received general acceptance even among laboratory workers on the subject.

I am, Sir, yours faithfully,

W. LANGDON BROWN.

Cavendish-square, W., Feb. 5th, 1920.

*** Dr. Langdon Brown's letter raises questions which can only be satisfactorily settled by physician and physiologist in conference at the bedside. The evidence that in hyperpiesis the lymph spaces contain toxins seems to us to be at present very incomplete. The realisation that a diminished alkaline reserve in the blood may mean either too much or too little acid in the body, and that the condition of the blood in this respect is no criterion of the condition of the body, further seems to us to alter the whole conception of acidosis. But these plastic considerations have hardly hardened sufficiently for the written word. Physiological principles must needs change in advance of the therapeutic measures based upon them, and it is Dr. Langdon Brown's special merit that the latter do not lag unduly in his book.—ED. L.

THE SEX-INCIDENCE OF PERNICIOUS ANÆMIA.

To the Editor of THE LANCET.

SIR,—In your report (THE LANCET, Jan. 31st) of the meeting of the Edinburgh Medico-Chirurgical Society held on Jan. 21st, to which I communicated the results of "An Inquiry Regarding the Age- and Sex-Incidence of Pernicious Anæmia," I am stated to have shown that the incidence of the disease "was distinctly more common in females than in males." My conclusions, eight in number, were read from the paper, and only one deals with this point. It is in the following terms: "Until the age of 50 the rate of incidence inclines to be higher in the female than in the male. Thereafter the rate is definitely higher in males than in females."

I made no statement regarding the mean rate for all periods of life in which a comparison was made between female and male rates.

I am, Sir, yours faithfully,

Feb. 7th, 1920. J. EASON, M.D.

THE INFECTIVITY OF TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—Some points in Dr. H. Batty Shaw's address on tuberculosis (THE LANCET, Jan. 24th) have already been criticised in your last issue. Emphasis has been laid on the infectivity of the disease, and as this is the crux of the whole problem it seems clear that a national scheme for prevention should now have our serious attention.

All will agree that so long as our tuberculosis schemes are based on the sanatorium they are bound to fail in controlling the disease. One might go further and claim that any scheme for the treatment of tuberculosis of the lungs is foredoomed to failure because death will be the inevitable result in the great majority of cases in which the disease has advanced so far as to be evident on examination of the chest. In a recent report to the London Insurance Committee Dr. N. D. Bardswell shows that there is no appreciable prolongation of life in the majority of the applicants for sanatorium benefit in the London area, and our records in Portsmouth show the same failure. Our present methods, then, are useless; when their cost is borne in mind they are worse than useless; and with a view to getting them altered tuberculosis officers everywhere ought to emphasise their poor results.

In the article referred to Dr. Shaw suggests that experimental work be done in the direction of (1) giving tuberculin to children before they are infected with tuberculosis; (2) vaccination against catarrhal infections in cases of tuberculosis. Is it his considered opinion that the adoption of these methods will be likely to lower the tuberculosis death-rate, especially when there is so little ground for the hope that tuberculin given to children before they have tuberculosis will substantially increase their resistance to the disease? In emphasising his theory that the immediate cause of the manifestations of tuberculosis in later life is auto-infection he seems to forget that infection originally is the cause of the disease, and if infection is stopped the subsequent auto-infection would be impossible. It is splitting hairs to draw fine distinctions as to when the infection may possibly take place. Let us emphasise rather that all tuberculosis is an infection, and that the logical means of controlling the disease is to try to prevent the further spread of this infection. In the present state of our knowledge prevention is the obvious line of advance, and not the elaboration of still further methods of treatment of doubtful value, methods which, after all, are based on his theory. Prevention is what the country is paying for, and it has never really been tried.

The tubercle bacillus gains access to man from two main sources: (1) through milk; and (2) from human infection.

(1) *Milk.*—It is generally accepted that the importance of milk in causing tuberculosis has been overrated, but it still remains a probable source in some cases. Ten per cent. of our milk contains the tubercle bacillus. The tuberculin test enables us to find the infected cows, and it should be an easy matter to clean up our herds, but we go on swallowing this infected milk and giving it to our children.

(2) *Human infection.*—Until segregation in large districts is adopted for all infective cases we are not attempting to deal with this source of the disease. Sooner or later this must be done, and if not done by us the next generation will do it. Dr. Shaw insists that there shall be no interference with the liberty of these infective cases unless generous treatment be provided. But if the community does all it can for them they ought to do something for the community; and if their presence in the community causes 140 deaths every day in England, in addition to an almost incalculable sickness-rate, the community can reasonably demand the removal of this danger, especially if it combines measures for its own protection with the best possible conditions for the prolongation of the lives of the victims. These conditions cannot be given in our midst where the struggle for existence is such that those with damaged lives cannot survive; they can be given only in districts specially set apart for the accommodation of tuberculous persons. The sanatoriums, hospitals, colonies, and other treatment centres could be collected together into, say, half a dozen large districts in the country, and encouragement given to all infective cases to settle in these districts. Free land, buildings, fuel, and a monetary grant per head could be given. Families could be admitted conditionally. The whole internal administration of the district should be managed by the patients themselves, including their marriage laws, manufactures, trade-unions, medical treatment, &c. Production would be carried on, though the district could not be entirely self-supporting. With such a scheme many difficulties would solve themselves, such as that of obtaining suitable employment after sanatorium treatment, and so heavily is the tuberculosis subject handicapped in getting suitable work that this reason alone would popularise such a scheme. There need be no fear that it would lead to concealment of disease provided reasonably generous conditions were given to these within the districts, as the outlook then for the patient would surely be preferable to being driven to the Poor-law infirmary in the last stages of his disease and his financial resources.

The cost of such a scheme when some production was carried on, and when the economy resulting from centralised administration is considered, could hardly be more than our present expenditure, directly and indirectly, on the tubercle bacillus. Compulsion would come later on when sufficient accommodation was available, when the inducements given in the district had popularised, and all infective cases would then be compelled to live in the district. The difficulties are great, but they are not insuperable; they must be overcome, and the Ministry of Health cannot better celebrate its birth than by tackling them. By all means let us eliminate as far as possible the predisposing causes of tuberculosis, and the greatest of these is bad housing; but until effective steps are taken to remove the massive doses of the exciting cause tuberculosis will continue to flourish.

I am, Sir, yours faithfully,
J. FAIRLEY,
Feb. 2nd, 1920. Tuberculosis Officer, Borough of Portsmouth.

AN OMISSION IN THE MEDICAL DIRECTORY.

To the Editor of THE LANCET.

SIR,—By a clerical error the name of Dr. E. Hyla Greves, of Rodney House, Bournemouth, was accidentally omitted from our current issue. Will your readers kindly note this?—Your obedient servants,

THE EDITORS OF THE MEDICAL DIRECTORY.
7, Great Marlborough-street, London, W.1, Feb. 10th, 1920.

Obituary.

LAURENCE HUMPHRY, M.D., F.R.C.P.,

PHYSICIAN, ADDENBROOKE'S HOSPITAL, CAMBRIDGE.

BY the death of Dr. Laurence Humphry, which occurred on Feb. 5th, the Cambridge Medical School has suffered a great loss, one that for the present, at any rate, seems irreparable. Dr. Humphry was mobilised at the 1st Eastern Hospital at the beginning of the war, and gave himself to his exacting duties with unselfish devotion. By no means a strong man his periods of rest were brief and infrequent; thus, as the war wore on, especially in the last year or two, his friends noticed that the strain was telling upon him. He looked thin and worn, yet still loyally worked on. In this susceptible state Humphry became affected by some obscure septic virus which, beginning in the tonsils, gradually spread to other parts in a long and painful illness, during which the hope of recovery faded away. He died at the age of 63.

Dr. Humphry was a nephew of Sir George Humphry, and inherited much of the family ability. His father was a London barrister-at-law, Laurence being born at Richmond. His mother was a daughter of Dr. McNab, of Epping, a physician of some eminence in his day. In 1889 he married Isabel, daughter of the late Professor Sir George Stokes. They had no children.

Humphry graduated at Cambridge from Trinity College in 1876, taking his M.B. four years later. He did his clinical work at St. Bartholomew's Hospital, and by his uncle's advice returned to settle in Cambridge, and soon began to build up a consulting practice in medicine. In later years, as his senior colleagues died or withdrew from the harder work, Humphry became the leading consultant in the district. He was physician to the Addenbrooke's Hospital, and had filled the offices of assessor to the Regius Professor of Physic, examiner in medicine to Cambridge and other universities, and served on the Council of the Royal College of Physicians of London. As teacher of pathology and lecturer in medicine he took an active part in the medical school, in which he was keenly interested. For 15 years—years of much change and revision—he was secretary to the Special Board of Medicine, a post to which he was admirably adapted. He was orderly and accurate in business, thoroughly familiar with the somewhat complex affairs and procedures of the University, and thus, and by his personal qualities, carried not a few difficult and thorny measures through the Special Board and the Senate.

Humphry, who had considerable talent for research, at one time took charge of the Pathological Museum. He was especially interested in malformations of the heart, on which subject he wrote the article in Allbutt's "System of Medicine." He made some researches also on the functions of the pancreas, on the parathyroid glands, and on embolic aneurysms of the pulmonary artery. He often regretted that he could not do more research work, but he was liable to frequent and intense attacks of migraine which made sad inroads upon his time and energy. As a clinical physician he was excellent; sympathetic, gentle, learned, and sagacious; moreover, he was well equipped on the scientific side of pathology.

Humphry was a man of rare charm of character; modest almost to self-effacement, high-minded, gentle, and with a keen sense of humour; but none the less decisive and wise in judgment. He was a chivalrous colleague and an affectionate friend. He had much taste and skill in the fine arts, in which he and his wife also had no little accomplishment. He was skilful in modelling in wax, especially his medallion work in low relief was very delicate and refined. During the earlier part of his illness he found in this work much relief from ailment and ennui. He was a skilful and almost an enthusiastic fisherman. He passes away deeply regretted.

CECIL R. CHAWORTH LYSTER, C.B.E., M.R.C.S.,

MEDICAL OFFICER IN CHARGE OF ELECTRICAL DEPARTMENT, MIDDLESEX HOSPITAL.

WE briefly recorded a fortnight ago the death of Mr. C. R. C. Lyster, which occurred on Jan. 26th, at the age of 60. Mr. Lyster until within a few months of his death was in charge of the X ray and electro-therapeutic department at the Middlesex Hospital, a post which he had held for the past 17 years. He received his medical education at Charing Cross Hospital, and subsequently became the medical superintendent at Bolingbroke Hospital, an institution he did much to foster, and with which he continued to be intimately associated until the closing year of his life.

Mr. Lyster's services to medicine, and especially to medical radiology, were many. His publications were few, and, indeed, form no guide to the many services he so freely rendered to the cause of humanity. It is essentially in the cause of humanity that his work should be adjudged. At the time when he began to take an executive interest in the therapeutic and diagnostic use of X rays little was known of their potentiality and still less of the dangers attending their use. It was during this period that he suffered from the first effects of continued exposure to fractional doses of the rays he was using, especially in the treatment of cancer. The damage that he suffered was progressive in character and eventually developed into cancer, to which he succumbed. He knew some years ago that a continuation of his work would entail additional risks to himself, but nothing could dissuade him from continuing to devote his energies towards alleviating the sufferings of others, and the work of his later years must be viewed in the light of a real sacrifice. The heavy demands of the war upon his services were cheerfully met. He undertook the responsible position of head of the X ray and electrical department at the Army Headquarters at Millbank, though the additional strain which this work involved was a very heavy one. The honour of C.B.E., conferred on him in recognition of his work, came too late.

Mr. Lyster did much to raise the status of medical radiology, and it was largely due to his efforts in the first place that a diploma of radiology and electrology, under the ægis of Cambridge University, became an accomplished fact. He was President of the Electro-therapeutic Section of the Royal Society of Medicine during 1918–19, and served on its council for a number of years. His breadth of outlook and unselfishness guaranteed a great respect among his colleagues for his views or proposals.

Mr. Lyster was a man who thoroughly understood his fellow-man, and was a large-hearted man in every respect. His personal charm and lofty character were appreciated by a wide circle, who will feel their loss very keenly.

EDWIN LINDSAY DUNN, B.A., M.B., B.CH. DUB.,
LATE MEDICAL SUPERINTENDENT, BERKSHIRE ASYLUM, WALLINGFORD.

Edwin Lindsay Dunn was born in 1865, the son of the late Mr. Robert Dunn, of Dunfield, Waterside, Ireland, and received his early education at Foyle College, Londonderry, winning a scholarship in 1876. After a successful schooling he entered Trinity College, Dublin, as first junior exhibitioner in 1882, taking his B.A. degree with honours in classics and English literature. He then decided upon medicine as a profession, and graduated M.B., B.Ch. in 1887 with honours in anatomy. He was appointed assistant house surgeon to the Children's Infirmary, Liverpool, assistant surgeon, Liverpool Dispensaries, and, upon adopting lunacy practice as a career, assistant medical officer at the West Riding Asylum, Wakefield. At the Wakefield Asylum he made several contributions to medical literature, including "Cases of Epilepsy Treated by Amylene Hydrate," "Case of Softening of Sensory Tract of Internal Capsule," and "Case of Homonymous Hemianopsia." His paper on "Paranoia," read at the Psychology Section of the British Medical Association at Nottingham in July, 1892, was a noteworthy addition to our knowledge of that disease, although cases had been recognised in England before then. In 1894 he was appointed senior assistant medical officer and deputy medical superintendent of the Berkshire Asylum, Wallingford, and on the death of Dr. J. W. A. Murdoch succeeded him as medical superintendent.

Outside his professional work, literature, Freemasonry, and sport made their appeal to Dunn. At school he was a member of the fifteen and a good runner; at Trinity College, Dublin, a prominent oarsman, rowing for the University Boat Club and winning many races, and a member of the University fifteen. He also played for the famous Wanderers Club, but although well in the running for the honour was not capped for Ireland. He was fond of shooting and golf and a good fisherman, his proudest trophy being a fine Thames trout, scaling 7½ lb., which he caught at Pangbourne. He was well read, talking with knowledge and originality on politics and religion—his knowledge of the Bible was profound. He read Greek for pleasure and was fond of French literature.

A friend writes: "A true Irishman, genial, quick-tempered, impulsive, generous to a fault, the soul of hospitality, excellent at repartee. His laugh was infectious; no one who heard it could forget it. He had a genius for making and keeping friends, and his jovial face, merry blue eye, and inimitable laugh will be sadly missed."

His death occurred after several weeks of pain borne with fortitude. Dr. Dunn was unmarried. The visiting committee of the asylum were his personal friends, and he was beloved by patients and staff, to whom his sympathy and advice were always open.

SIR JAMES GRANT, M.D. MCGILL, M.R.C.P. LOND.

FEW men can have lived a fuller or more varied life than James Alexander Grant, who was born at Inverness in 1831 and died at Ottawa on Feb. 8th last. In the "sixties," after suffering himself from surgical blood-poisoning, he was led to test the effect of vaccine lymph on various skin diseases, thus foreshadowing the later results of serum therapy. A medical graduate of McGill, an F.R.C.S. Edin., and M.R.C.P. Lond., he presided at one time over the College of Physicians and Surgeons in Ontario, and at another over the Royal Society of Canada. His political career included the introduction to the Legislature of the Pacific Railway Bill. As a geologist he held a position of some eminence. Knighted at the height of his public reputation, he lived for 35 years in well-deserved enjoyment of the honour.

Medical News.

A WORLD CONGRESS OF PHYSICIANS AND SURGEONS.—Dr. F. F. Simpson, with introductions from some of the chief representatives of medicine and surgery in the United States, is in London to consult with our leading men in the profession as to the coördinating and standardising of all branches of medicine so as to form a World Congress of Physicians and Surgeons, composed of the various international congresses and associations already established. The creation of international associations to deal with specialties which are not already thus provided is also to be considered. A meeting will be held to-day (Friday, Feb. 13th), at 5.30, at the House of the Royal Society of Medicine, and it is hoped also to arrange for conferences in Paris, Brussels, and Rome at early dates.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At recent examinations for the Diploma in Public Health the following candidates were recommended for the diploma:—

Geoffrey Andrew Bird, St. Thomas's and Middlesex; Kathleen Lydia Cass, Univ. Coll.; Frederick Adderley Howard Clarke, St. Bart.'s and R.A.M. College; Sheldon Francis Dudley, St. Thomas's; Walter Egbert Fox, Guy's; Henry Cecil Jennings, St. Thomas's; Ralph De Veil King, Univ. Coll. and St. Mary's; Alexander Frank Knott, Guy's; Bessie Russell MacKenzie, Edinburgh and King's Coll.; Rees Phillips, Middlesex and Univ. Coll.; Carrie Sims, Birmingham and Univ. Coll.; Hector Smith, Univ. Coll.; John Stewart, Glasgow; John Reginald Arthur Digby Todhunter, St. Thomas's and Univ. Coll.; and Frederick Norman White, St. Bart.'s and Univ. Coll.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—A quarterly meeting of the College was held on Feb. 3rd, Sir Robert Philip, the President, in the chair, when M. Eleutherios Venizelos, Prime Minister of Greece, was elected an Honorary Fellow, and Mr. Leo Ferdinando Bianchi and Dr. William Hughes were elected Fellows. The following were admitted to the Membership of the College: Dr. D. H. D. Cran, Dr. P. C. Davie, Dr. H. C. Elder, Dr. D. Cook, and Dr. E. W. Frecker. Licences to practise were granted (in conjunction with the associated bodies) to 11 candidates who had fulfilled the conditions and passed the Final examination.—The President announced that the Supplementary Royal Charter, dated Dec. 3rd, 1919, had now been delivered, and empowered the College to admit women to the Membership and Fellowship of the College on the same conditions and with the same privileges as men.—Sir Robert Philip was appointed a Trustee of the College.

COMPLIMENTARY DINNER TO SIR BERTRAND DAWSON.—Dr. Addison, the Minister of Health, and Sir Robert Morant will be present at the complimentary dinner offered to Sir Bertrand Dawson on his elevation to the peerage by the Federation of Medical and Allied Societies. All communications should be made to the secretary, Dr. Howard Mummery, at the offices of the Federation, 5, Vere-street, Cavendish-square, W.1.

COMPLIMENTARY DINNER TO SIR GEORGE MAKINS.—A complimentary dinner will be given to Sir George Makins on a date in May which remains to be fixed. Sir Cuthbert Wallace will be in the chair, and St. Thomas's men, as well as medical officers who were associated with Sir George Makins in the B.E.F., are asked to communicate with Mr. C. Max Page, 134, Harley-street, W.1, if they desire to be present. Final arrangements can then be made, of which due notice will be given.

THE TUBERCULOSIS SOCIETY.—At a general meeting of the members of the Tuberculosis Society it was decided that the society should not affiliate with the Federation of Medical and Allied Societies. As far as medical societies are concerned, the Tuberculosis Society considers that a subcommittee of the British Medical Association could ascertain their views. On the ascertainment of the views of the public the Tuberculosis Society is silent.

H.R.H. Princess Mary will lay the foundation-stone of a nurses' home in the grounds of the Royal Hospital and Home for Incurables, Putney, on Wednesday, May 12th. The Princess has consented to receive purses, containing 5 guineas or upwards, towards the cost of the new building from ladies and young people who will have the honour of presenting their gifts at the foundation-stone laying ceremony. An album in which will be given the names and postal addresses of those presenting the purses will be prepared for Her Royal Highness. All wishing to give purses should write at once to the secretary of the Royal Hospital and Home for Incurables, Putney, at the City offices, Bond Court House, Walbrook, E.C.4.

THE Preston and County of Lancaster Queen Victoria Royal Infirmary have received from Lord Ashton a gift of £5000.

AN Order has been issued under the Anthrax Prevention Act, 1919, prohibiting, on and after Feb. 9th, the importation into the United Kingdom of shaving brushes manufactured in or exported from the Empire of Japan.

THE President of the French Republic, M. Poincaré, late Rector of the University of Glasgow, has conferred the Cross of Officer of the Legion of Honour upon Dr. James H. Nicoll, consulting surgeon to the Western Infirmary and Rector's Assessor in the Glasgow University Court from 1914 to 1919. Dr. Nicoll has been granted the Royal permission to accept and wear the decoration.

THE Ministry of Health is now making grants in aid of the blind, and with a view to coördination of effort has secured the close coöperation of the National Institute for the Blind, of which Sir Arthur Pearson is President. A Joint Committee representing the Advisory Committee on the Welfare of the Blind which sits at the Ministry and the National Institute for the Blind has accordingly been set up, and a desire is expressed that ways of diminishing overlapping and of preventing waste of effort in the collection of voluntary contributions shall, among other things, be considered.

ROYAL INSTITUTION.—On Tuesday next, Feb. 17th, at 3 o'clock, Professor Ernest Wilson begins a course of two lectures at the Royal Institution on Magnetic Susceptibility. On Saturday, Feb. 21st, Professor Sir J. J. Thomson begins a course of six lectures on Positive Rays. The Friday evening discourse on Feb. 20th will be delivered by Dr. E. J. Russell on British Crop Production, and on Feb. 27th by Mr. W. B. Hardy on Problems of Lubrication.

MANCHESTER MEDICAL SOCIETY.—The Presidential address of Professor R. B. Wild, which was delivered on Feb. 4th, had the comprehensive title "Some Racial Problems, Social Evils, and Modern Crusades." The racial problems concerned the falling birth-rate and its accentuation by the war, and general eugenics, as well as the care of the feeble-minded, were briefly discussed under this heading. The effects of tuberculosis, cancer, gout, and venereal diseases upon the race, as opposed to their effects upon the individual, were considered, as well as the prevalence of certain drug addictions—alcohol, caffeine, and nicotine—whose causes and results were compared and reviewed in an interesting dissertation.

CENTRAL COUNCIL OF INFANT AND CHILD WELFARE WORK.—At a meeting held at the Mansion House, London, on Feb. 4th Sir Arthur Stanley announced that the sum of £10,000 had been received by the Central Council as the result of the Victory Ball. This sum, though a happy and auspicious beginning, was a mere drop in the ocean compared with what was needed. Twelve existing societies connected with the furtherance of infant welfare had agreed to combine, and the aim of the Central Council was to do nothing that would diminish the strength and individuality of its component societies, but to get the money necessary for their work, and intervene only to prevent waste and overlapping.

GRANT TO THE VILLAGE CENTRES COUNCIL.—Queen Alexandra has decided to bestow with certain limitations the interest which will accrue annually from the surplus of £3000 from the Queen Alexandra's Field Force Fund to the Village Centres Council for the benefit of the disabled ex-Service men at their first village centre at Enham, in Hampshire. This will enable the relief which her fund sent abroad during the war years to continue and to benefit the victims of that war and fit them for usefulness in days to come. The Council is at present giving 150 ex-Service men medical treatment combined with curative and vocational training. The Committee hope to accommodate eventually 500 men. The present centre owes its inception to voluntary generosity, which is now supplemented by a capitation grant received from the Ministry of Pensions for each patient, and it is hoped that when the numbers reach 225 these fees, together with the produce sold from gardens, farms, and workshops, will place Enham on a self-supporting basis, though capital will still have to be found for further extension and a cottage scheme. The Executive Committee is at present considering the best way of laying out the annual amount which they will receive from Queen Alexandra's Field Force Fund.—The town of Southampton is increasing its donation of £500 for the Southampton Hut at the Enham Village Centre to £1000, and the city of Winchester has also contributed the sum of £500 for a Winchester Hut. It is hoped that many other cities in the United Kingdom will follow the lead given by Southampton and Winchester. Full particulars regarding the work of the Village Centres Council can be obtained from the secretary at 51, Lincoln's Inn Fields, London, W.C. 2.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.
THURSDAY, Feb. 19th.—Papers:—Prof. B. Moore and Mr. T. A. Webster: Studies of Photo-synthesis in Fresh-water Algæ.—Prof. W. M. Bayliss: The Properties of Colloidal Systems. IV., Reversible Gelation in Living Protoplasm.—The Rev. F. J. Wyeth: The Development of the Auditory Apparatus in Sphenodon Punctatus (communicated by Prof. A. Dendy).

ROYAL SOCIETY OF MEDICINE 1, Wimpole-street, W.

Tuesday, Feb. 17th.

SPECIAL GENERAL MEETING OF FELLOWS: at 5 P.M.
To consider, and if approved to confirm, proposal by the Council to constitute a new Section—viz., a Section for dealing with questions specially pertaining to Urology.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for Election to the Fellowship. (Names already circulated.)

MEETINGS OF SECTIONS.

Tuesday, Feb. 17th.

THERAPEUTICS AND PHARMACOLOGY (Hon. Secretaries—Philip Hamill, Douglas Cow): at 4.30 P.M.
Discussion:
On "The Value of Alcohol as a Therapeutic Agent," to be opened by Dr. H. H. Dale, C.B.E., F.R.S.
The following will also take part:—Dr. A. P. Beddard, Dr. Langdon Brown, Sir William Hale White, Dr. R. Hutchison, Dr. O. Leyton, Dr. E. Mellanby, Professor R. B. Wild, and Dr. W. H. Willcox.
Others wishing to speak should send their names to Dr. Douglas Cow, Great Shelford, near Cambridge.

MEDICINE.—Members of this Section are cordially invited to take part in the above Discussion.

PATHOLOGY (Hon. Secretaries—J. A. Murray, Cecil Price-Jones): at 8.30 P.M.
A meeting will be held in the Pathological Laboratory, St. Bartholomew's Hospital, E.C.1.

Wednesday, Feb. 18th.

HISTORY OF MEDICINE (Hon. Secretaries—Arnold Chaplin, F. G. Crookshank): at 5 P.M.
Paper:
Dr. R. C. Buist: The Salernitan Verses and their English Versions.

Thursday, Feb. 19th.

DERMATOLOGY (Hon. Secretary—Henry MacCormac): at 5 P.M.
Cases (at 4.30 P.M.):
Dr. Graham Little: (1) Anæsthetic Leprosy; (2) Urticaria Pigmentosa in Adult; (3) Morphœa with Acute Onset.
Dr. Gray: (1) Generalised Rodent Ulcer; (2) Extensive Vascular Nævus; (3) Case for Diagnosis
Dr. Sibley: Leucodermia.

Friday, Feb. 20th.

OTOLOGY (Hon. Secretaries—H. Buckland Jones, Lionel Colledge): at 5 P.M.
Cases and Specimens will be shown by—
The President (Mr. Herbert Tilley), Mr. Lionel Colledge, Dr. Dundas Grant, Mr. Richard Lake, Dr. Dan McKenzie, and Mr. O'Malley.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Feb. 16th.—9 P.M., Lettsomian Lecture: Dr. H. R. Spencer: Tumours Complicating Pregnancy, Labour, and the Puerperium. (Lecture II.)

CHELSEA CLINICAL SOCIETY, at the Club Room of St. George's Hospital Medical School.
TUESDAY, Feb. 17th.—8.30 P.M., Cases and Specimens will be shown.

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Feb. 17th.—4.30 P.M., Pathological Specimens. Cases sent for Consultation. Clinical Cases will be shown.

SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
FRIDAY, Feb. 20th.—8.30 P.M., Discussion on Small Pox, opened by Colonel W. G. King, C.I.E., I.M.S. (retd.). Paper:—Lieut.-Colonel N. H. Fairley, A.A.M.C., and Capt. H. R. Dew, R.A.M.C.: Causes of Death from Malaria in Palestine—A Study in Cellular Pathology.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, Feb. 16th, AND WEDNESDAY.—5 P.M., Hunterian Lecture:—Prof. W. G. Spencer, O.B.E.: The Historical Relationship between Experiments on Animals and the Development of Surgery. (Lectures II. and III.)
FRIDAY.—5 P.M., Arris and Gale Lectures:—Prof. G. E. Smith: The Evolution of the Cerebellum. I., The Origin of the Cerebellum.

UNIVERSITY OF LONDON.
Advanced Lectures in Physiology to Students of the University and others interested in the subject.
A Course of Eight Lectures on Physiologically Balanced Solutions will be given by Dr. W. L. Symes in the Physiological Laboratory of the University, South Kensington, S.W.:—
TUESDAY, Feb. 17th.—5 P.M., Lecture IV.
A Course of Eight Lectures on the Reaction of the Blood and Acidosis will be given by Dr. J. W. Trevan, at St. Bartholomew's Hospital, West Smithfield, E.C.:—
WEDNESDAY, Feb. 18th.—4.30 P.M., Lecture IV.

A Course of Eight Lectures on the Regulation of Respiration will be given by Dr. M. S. Pembrey and Mr. J. H. Ryffel at Guy's Hospital, Borough, S.E.:—
THURSDAY, Feb. 19th.—4.30 P.M., Lecture VII.

LONDON HOSPITAL MEDICAL COLLEGE (UNIVERSITY OF LONDON), Mile End, E.
A Course of Instruction on the Diseases of Children, open to Post-Graduates and to Students of the Hospital. (The lectures will be illustrated by lantern slides.)
MONDAY, Feb. 16th.—9.15 A.M., Lecture VI.:—Dr. Thompson: Organic and Functional Nervous Diseases, Meningitis and Mental Deficiency. (At the Anatomical Theatre.)
WEDNESDAY.—10 A.M., Clinical Demonstration:—Dr. Miller. (At the Children's Out-patient Department.)
SATURDAY.—10.15 A.M., Lecture VII., Dr. Hutchison: General Diseases. (At the Anatomical Theatre.)

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL (UNIVERSITY OF LONDON).
A Post-Graduate Course of Lectures on Syphilis is being given by various members of the staff of King's College Hospital during the present year.
FRIDAY, Feb. 20th.—9.15 P.M., Dr. A. Whitfield: The Early Stages of Syphilis, especially in its Cutaneous Manifestations.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART POST-GRADUATE COURSE, Westmoreland-street, W.
MONDAY, Feb. 16th.—11 A.M., Out-patients: Dr. Goodall. 2 P.M., In-patients: Dr. Moon.
TUESDAY.—2 P.M., Out-patients: Dr. R. Wells. 3 P.M., In-patients: Dr. Gibbes.
WEDNESDAY.—2 P.M., Out-patients: Dr. Moon. 5.30 P.M., Lecture:—Dr. Goodall: Arteriosclerosis.
THURSDAY.—10 A.M., In-patients: Dr. Hamill: 2 P.M., Out-patients: Dr. Price.
FRIDAY.—2 P.M., Out-patients: Dr. Gibbes. 2.30 P.M., In-patients: Dr. Wells.
SATURDAY.—10.30 A.M., In-patients: Dr. Hamill.

ROYAL INSTITUTE OF PUBLIC HEALTH, in the Lecture Hall of the Institute, 37, Russell-square, W.C.
Special Course of Lectures and Demonstrations on Tuberculosis for Medical Men and Women qualifying to become Tuberculosis Officers, General Practitioners, and others. Bacteriological Demonstrations will be given in the Laboratories of the Institute, and visits arranged to Sanatoriums, Tuberculosis Dispensaries, &c.
THURSDAY, Feb. 19th.—5 P.M., Lecture VI.:—Dr. S. R. Gloyne: The Problem of Immunity in Tuberculosis.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
TUESDAY, Feb. 17th.—2 P.M., Demonstration:—Mr. J. H. Evans: Cases illustrating Diseases of the Breast. 4.30 P.M., Lantern Lecture:—Dr. J. Metcalfe: The X Ray Examination of Diseases of the Digestive Tract.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, W.C. 1.
MEDICAL SCHOOL.
MONDAY, Feb. 16th.—2–3.30 P.M., Out-patient Clinic: Dr. Collier. 3.30 P.M., Mr. Paton: Optic Atrophy.
TUESDAY, Feb. 17th.—2–3.30 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Ward Cases: Dr. James Taylor.
WEDNESDAY, Feb. 18th.—2 P.M., Mr. Armour: Surgical Treatment of Cerebral Tumours. III. 3.30 P.M., Dr. Grainger Stewart: Disseminated Sclerosis. II.
THURSDAY, Feb. 19th.—2–3.30 P.M., Out-patient Clinic: Dr. Farquhar Buzzard. 3.30 P.M., Dr. Farquhar Buzzard: Intracranial Tumours.
FRIDAY, Feb. 20th.—2–3.30 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Ward Cases: Dr. Collier.
SATURDAY, Feb. 21st.—9 A.M., Surgical Operations.
Fee for Post-Graduate Course £7 7s. C. M. HINDS HOWELL, Dean.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
SATURDAY, Feb. 14th.—12 noon, Dr. Souttar: Surgical Anatomy of the Abdomen.
MONDAY, Feb. 16th.—5 P.M., Mr. Macdonald: Tuberculous Disease of Urinary Tract.
TUESDAY.—5 P.M., Dr. Burnford: Clinical Lecture, with cases.
WEDNESDAY.—5 P.M., Dr. Beddard: Practical Medicine. (Lecture II.)
THURSDAY.—12 noon, Mr. Sinclair: Surgical Demonstration.
FRIDAY.—5 P.M., Special Lecture:—Dr. A. C. Jordan: The Radiography of Chronic Intestinal Stasis.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, S.W.
WEDNESDAY, Feb. 18th.—4.30 P.M., Dr. Hartley: Pneumothorax.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.
TUESDAY, Feb. 17th.—3 P.M., Prof. E. Wilson: Magnetic Susceptibility. (Lecture I.)
FRIDAY.—9 P.M., Dr. E. J. Russell: British Crop Production.
SATURDAY.—3 P.M., Prof. Sir J. J. Thomson, O.M.: Positive Rays. (Lecture I.)

UNIVERSITY OF SHEFFIELD—FACULTY OF MEDICINE POST-GRADUATE DEMONSTRATIONS, at the Sheffield Royal Hospital.
MONDAY, Feb. 16th.—3.30 P.M., Dr. Nutt: X Ray Examination of Thorax.
TUESDAY.—4 P.M., Dr. Hay: Diseases of Iris and Ciliary Body.
WEDNESDAY.—3.30 P.M., Dr. Wilkinson: Common Laryngeal Ailments.
THURSDAY.—3.30 P.M., Dr. Skinner: Seborrhœa, Alopecia, &c.
FRIDAY.—4 P.M., Dr. Hay: Diseases of Lens: Glaucoma.

UNIVERSITY OF BIRMINGHAM—FACULTY OF MEDICINE, in the Anatomical Theatre, Edmund-street, Birmingham.
Post-Graduate Course of Lectures on Venereal Disease:—
WEDNESDAY, Feb. 18th.—4.15 P.M., Mr. B. Whitehouse: Gonorrhœa in the Female. (Lecture II.)

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, Feb. 17th.—4.30 P.M., Lecture:—Dr. C. H. Melland: Polio-encephalitis and Lethargic Encephalitis.

SALFORD ROYAL HOSPITAL AND ANCOATS HOSPITAL POST-GRADUATE DEMONSTRATIONS, at the two Hospitals alternately.
THURSDAY, Feb. 19th.—4.30 P.M., Lecture:—Mr. Ollerenshaw: Common Injuries and their Treatment from an Orthopædic Point of View. (At Salford Royal Hospital.)

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

JAMES, F., M.D., D.P.H., has been appointed Medical Officer of Health for the Royal Borough of Kensington.
Royal Free Hospital: WILLIAMSON, G. S., M.B., Ch.B., Pathologist; CHODAK, H. H., M.D., M.R.C.P., Assistant Physician.
Certifying Surgeons under the Factory and Workshop Acts: HALLINAN, J. C., M.R.C.S., L.R.C.P. Lond. (Rotherham); CASSIDY, J. P., L.R.C.P. & S. Irel. (Lisnaskea); MCLOUGHLIN, H., M.B., B.Ch. Irel. (Rostrevor); CHRISTIE, W. M., M.B., Ch.B. Edin. (Catrine); GUTTERIDGE, B. G., M.R.C.S., L.R.C.P. Lond. (Shardlow); HEISER, A. L., M.R.C.S., L.R.C.P. Lond. (Colnbrook); SHARP, E. W. L., M.R.C.S., L.R.C.P. Lond. (Burnham Market); WILSON, G. P., M.R.C.S., L.R.C.P. Lond. (Ketton).

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—Third H.S. £150.
Bedford County Hospital.—H.P. £150.
Birkenhead Borough Hospital.—Two H.S.'s. £200 and £170.
Birmingham, City Hospital, Little Bromwich.—Asst. M.O. £300.
British Guiana.—Asst. M.O. £400.
Cancer Hospital (Free), Fulham-road, S.W.—Asst. Anæsth. 25 g.
Carlisle, Cumberland Infirmary.—Res. M.O. £200.
Chartham, near Canterbury, Kent County Mental Hospital.—Jun. Asst. Third M.O. £300.
Chorley Borough.—M.O.H. and School M.O. £700.
Croydon County Borough Mental Hospital, Upper Warlingham, Surrey.—Second Asst. M.O. £500.
Denbigh, North Wales Counties Mental Hospital.—Locum Tenens. £7 7s. p.w.
Derby, Derbyshire County Council Tuberculosis Committee.—Asst. Res. M.O. £300.
Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £200.
Devonport, Royal Albert Hospital.—H.S. £200.
Dorchester, Dorset County Council Education Committee.—School Dentists. £400.
Dudley County Borough.—Asst. Sch. M.O. and M.O.H. £500.
Dumfriesshire Education Authority.—Female Med. Asst. £400.
East Ham County Borough.—Tuberc. O. and Res. M.O. at "Harts" Sanatorium, Woodford. £500.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Two Asst. P.'s.
Essex, Brentwood Mental Hospital.—Fourth Asst. M.O. £510.
Falkland Islands.—Dent. S. £500.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.P and Asst. H.S. £175 and £150 each.
Govan District Asylum, Hawkhead, Cardonald, Glasgow.—Jun. Asst. M.O. £300.
Great Yarmouth General Hospital.—H.S. £200.
Greenwich and Deptford L.C.C. School Clinic Committee.—Refractionist, P., Aural S., and Anæsth. £70 each. Also Dentist. £50.
Hampshire County Council.—Asst. M.O.H. £540.
Hospital for Sick Children, Great Ormond-street, London, W.C.—P. to Out-patients.
Hull Royal Infirmary.—Asst. H.S. £250.
Jerusalem, British Ophthalmic Hospital.—Asst. Res. S.
Lancashire County Council, School Medical and Child Welfare Department.—Dentist. £600.
Lancaster County Asylum.—Asst. M.O. £300.
Leeds General Infirmary.—M.O.'s for Radiol. Dept. and Electro- and Radio-Therap. Dept. £100 each.
Leeds Public Dispensary.—Hon. Radiologist.
Leicester City Isolation Hospital and Sanatorium, Groby-road.—Second Res. M.O. £300.
Lincoln County Hospital.—Jun. H.S. £150.
Lindsey County Council.—Asst. Tuberc. O. and Asst. Sch. M.O. £550.
Liverpool Infirmary for Children.—H.S. and H.P. £90.
Liverpool, Royal Southern Hospital.—Hon. Ophthal. S. Also Hon. Asst. P.
London Hospital Medical College, Mile End, E.—Lecturer on Neuroses and Psycho-Neuroses.
Maidstone, West Kent General Hospital.—H.P. £200. Hon. Orthop. S. and M.O.
Manchester, Crumpsall Institution and Infirmary, Crescent-road.—Asst. M.O. £300.
Manchester Hospital for Consumption and Diseases of the Throat and Chest, Bowdon, Cheshire.—Res. M.O. £250.
Manchester Royal Infirmary.—H.P.'s.
Margate, Royal Sea-Bathing Hospital for Surgical Tuberculosis.—Res. S. £200.
Merthyr Tydfil County Borough.—Female M.O. £500.
Miller General Hospital for South-East London, Greenwich, S.E.—H.P. and Registrar. £100.
Newcastle-upon-Tyne, Hospital for Sick Children.—Junior Res. M.O. £200.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Anæsth. £120.

Northumberland County Council.—County M.O.H. and Sch. M.O. £800.
Norwich City.—Asst. M.O.H. £350.
Nottingham General Hospital.—Hon. M.O. for X Ray and Electro-Therapeutic Dept.
Notts County Council.—Asst. Tuberc. O. and Asst. Sch. M.O. £500.
Queen Mary's Hospital for the East-End, Stratford, E.—Hon. Asst. P.'s. Res. M.O.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Res. M.O. £200.
Reading, Royal Berkshire Hospital.—Second H.S. £200.
Roll of Honour Hospital for Children, 688, Harrow-road, W.—Clinical Asst.
Royal Chest Hospital, City-road, E.C.—Res. M.O. and H.P. £200 and £120.
Royal College of Surgeons in Ireland.—Lectureship. £150.
Russian Red Cross in Great Britain, 35, Albemarle-street, W.—M.O.
St. Bartholomew's Hospital and College.—Sen. Demonstr. of Physiology. £400.
St. Thomas's Hospital, S.E.—Fellowship. £600.
Sheffield, East End Branch of the Children's Hospital.—H.S. £150.
Sheffield Royal Hospital.—Asst. Cas. O. £120.
Shirlett, near Much Wenlock, King Edward VII. Memorial Sanatorium.—Res. Med. Supt. £450.
South London Hospital for Women, South Side, Clapham, S.W.—Female Dental S. £25. Asst. Pathologist.
Southport General Infirmary.—Sen. H.S. £250.
Stoke-on-Trent.—Female M.O. £500.
Sunderland County Borough.—Asst. M.O.H. and Maternity and Child Welfare M.O. £500.
Swindon Borough.—Asst. M.O.H. £600.
Wakefield, West Riding County Council.—Sch. Med. Inspector. £500.
Wigan County Borough Education Committee.—Part-time School Dentist. £150.
Winchester, Royal Hampshire County Hospital.—H.P. £250.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Broughton Astley, Long Melford, Maidenhead, Shelf, Shrewsbury, South Molton, and at Uphall.

Births, Marriages, and Deaths.

BIRTHS.

ELLIOTT.—On Feb. 6th, at the Richmond Hill Nursing Home, Aberdeen, the wife of Walter Armstrong Elliott, M.B., B.S., of a daughter.
GILLIATT.—On Feb. 5th, 1920, at 58A, Wimpole-street, London, W., the wife of W. Gilliatt, F.R.C.S., of a daughter.
KENNEDY.—On Feb. 4th, at Boughton, near Faversham, Kent, the wife of Arthur Kennedy, M.A., M.B., Ch.B., of a daughter.
O'NEILL.—On Jan. 8th, at Meerut, the wife of Major J. S. O'Neill, M.C., I.M.S., of a daughter.

MARRIAGES.

HUMPHREYS—HUDSON.—On Feb. 5th, at Knowle Parish Church, Humphrey Humphreys, M.C., M.B., to Constance Hudson, eldest daughter of Mrs. R. B. Cooper, of Knowle.
MACINNES—WOOD.—On Feb. 6th, at St. John's Wood Presbyterian Church, London, John MacInnes, M.B., to Mabel Maude, daughter of Richard Wood, Esq., New South Wales.
ROBINSON—MACDONALD.—On Feb. 3rd, at the Congregational Church, Barnsley, Captain Christian Cathcart Robinson, R.A.M.C. (T.F.), to Jessie Leonora, second daughter of Mr. Allan Macdonald, Oaklands, Huddersfield-road, Barnsley.

DEATHS.

CLERY.—On Feb. 10th, at St. John's Park, Blackheath, S.E., Surgeon-General J. A. Clery, C.B. (retired), late A.M.S.
HUMPHRY.—On Feb. 5th, at Lersfield, Cambridge, from illness contracted while on service at the 1st Eastern Hospital as Lieutenant-Colonel, R.A.M.C. T., Laurence Humphry, M.D., F.R.C.P., Senior Physician to Addenbrooke's Hospital, aged 63.
LAKE.—On Feb. 8th, at Benton, Teignmouth, William Charles Lake, M.D., aged 94.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, J. B., ET FILS, Paris.
Guide Pratique pour l'Examen Médical des Aviateurs et des Candidats à l'Aviation. Par le Dr. Maublanc et le Dr. Ratié, Médecins du centre d'Aviation de Chartres. Préface par le Dr. André Broca. 3 fr.
L'Art de Prescrire. Par le Prof. Gilbert, Professeur de Clinique Médicale à l'Hôtel Dieu. 12 fr.

LEWIS, H. K., London.
Military Psychiatry in Peace and War. By C. S. Read, M.D. Pp. 168. 10s. 6d.
The Diagnostics and Treatment of Tropical Diseases. By E. R. Stitt, M.D. 3rd ed. Pp. 534. 14s.
Handbook of Sanitary Law. By B. B. Ham, M.D., D.P.H. 8th ed. Edited by H. R. Kenwood, M.B., D.P.H. Pp. 216. 5s.

LIPPINCOTT (J. B.) COMPANY, London.
Oscar Montague-Paranoiac. By G. L. Walton. Pp. 304. 6s.

LIVINGSTONE, E. AND S., Edinburgh.
Wheeler's Handbook of Medicine. By W. R. Jack, M.D. 6th ed. Pp. 561. 12s.

LONGMANS, GREEN, AND CO., London.
A Manual of Practical Anatomy. By Prof. T. Walmsley. With Preface by Prof. T. H. Bryce. Part I.: Upper and Lower Limbs. Pp. 176. 9s.

MACMILLAN AND CO., London.
Essays on the Surgery of the Temporal Bone. By Sir Charles A. Ballance, K.C.M.G., F.R.C.S. With the assistance of C. D. Green, M.D., F.R.C.S. Two vols. Pp. 612. £5 5s.
A Class-Book of Organic Chemistry. By J. B. Cohen, B.Sc. Vol. II. Pp. 156. 4s. 6d.

MASSON ET CIE., Paris.
La Tension Artérielle en Clinique: Sa Mesure, sa Valeur Sémiologique. Par le Dr. L. Gallavardin, Médecin des Hôpitaux de Lyon. 2nd ed. Pp. 720. 30 fr. net.

METHUEN AND CO., London.
Chemistry for Public Health Students. By E. G. Jones, M.Sc. Pp. 244. 6s.

MURRAY, JOHN, London.
Science and Life. By F. Soddy, F.R.S. Pp. 229. 10s. 6d.
Springtime and Other Essays. By Sir Francis Darwin, F.R.S. Pp. 242. 7s. 6d.

OLLIER-HENRY, Paris.
Contribution à l'Etude du Traitement des Plaies de Guerre par la Méthode Mencière. Par Dr. F. Brabander. Pp. 142.

SWARTHMORE PRESS, 72, Oxford-street, London.
The Famine in Europe: The Facts and Suggested Remedies. By Lord Parmoor, Sir George Paish, Prof. Starling, and Others. Being Report of Conference by Fight the Famine Council at Caxton Hall in November, 1919. Pp. 126. 4s. 6d.

THE LORD BALTIMORE PRESS, Baltimore.
Proceedings of the American Medico-Psychological Association, June, 1918. Pp. 397.

UNIVERSITY PRESS, Cambridge. HENRY CLAY, London.
Food Poisoning and Food Infections. By W. G. Savage, M.D. Pp. 247. 15s.

VAILLANT-CARMANNE, H., Liege.
La Fatigue de l'Appareil Visuel chez les Ouvriers Mineurs. Par le Dr. M. Stassen. Pp. 234.

WILLIAMS AND NORGATE, London.
Engines of the Human Body. By Prof. A. Keith, F.R.S. Pp. 284. 12s. 6d.

Communications, Letters, &c., to the Editor have been received from—

B.—Mr. W. B. Brierley, Harpenden; Dr. H. S. Banks, Motherwell; Dr. W. L. Brown, Lond.; Dr. E. Bramwell, Edinburgh; Mr. H. W. Bayly, Lond.; Mr. H. N. Barnett, Bath; Dr. J. P. Bibby, Leeds; Mr. C. Berkeley, Lond.; Dr. G. Blacker, Lond.; Dr. M. Bourcart, Geneva; Messrs. G. Bell and Sons, Lond.; Dr. H. Brown, Lond.; Dr. A. E. Boycott, Lond.; Dr. J. L. Birley, Lond.; Sir J. R. Bradford, Lond.; Mr. J. Breuer, Leysin; Sir N. Burnett, Lond.; Dr. H. Brown, Chislehurst.
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I.—*International Psychic Gazette*, Lond., Editor of.
J.—Dr. G. Jones, Lond.; *Journal of the American Medical Association.*
K.—Dr. R. Knox, Lond.; Lieut.-Col. J. Kynaston, R.A.M.C.; King's College Hospital Medical School, Lond., Sec. of.
L.—Maj.-Gen. Sir W. B. Leishman; Mrs. J. Lublin, Lond.; Dr. J. H. W. Laing, Guildford; Dr. G. C. Low, Lond.; London Society, Sec. of; Dr. T. D. Lister, Lond.; Dr. E. C. Lowe, Southport; Lamson Agency, Lond.
M.—Ministry of Health, Lond.; Sir N. Moore, Lond.; Manchester Royal Infirmary, Sec. of; Miss N. March, Lond.; Dr. C. S. Myers, Lond.; Dr. W. F. Menzies, Cheddleton; Mr. H. Murray, Lond.; Dr. M. F. Moloney, Dungarvan; Manchester Medical Society, Editor of.
N.—Major V. Nesfield, I.M.S.; National Anæsthesia Research Society, Avon Lake, Ohio; National Baby Week Council, Lond., Sec. of.
O.—Dr. R. A. O'Brien, New York.
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U.—Mr. A. R. Upton, Goodmayes.
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W.—W. and F. Film Service, Lond.; Prof. R. B. Wild, Manchester; West London Post-Graduate College, Sec. of; Mr. K. M. Walker, Lond.; Mr. J. Walker, Bromley; Dr. J. D. Wynne, Norwich.

Communications relating to editorial business should be addressed exclusively to the Editor of THE LANCET, 423, Strand, W.C.

Notes, Short Comments, and Answers to Correspondents.

MAN'S ORIGIN.

THE last of a series of lectures[1] on the origin and distribution of man upon the earth was given by Professor G. Elliot Smith at the Royal Institution on Feb. 10th. The importance of gold has loomed large to the public attention in recent years, yet its place in primitive society, thousands of years before it became the basis of currency, was certainly not less influential.

The Search for Gold: the First Explorers.

The story of an ethnological discovery of revolutionary import, connecting the spread of the earliest civilisation with man's search after gold, was told with graphic interest—an interest which was heightened by the fact that the lecturer himself had played so large a part in unveiling the records of the distant past. It was in 1908 that Professor Smith, researching amongst the mummified remains of early civilisations in Egypt, discovered traces of an alien population who had lived in that country shortly before the building of the Pyramids. A year later, when he was pursuing the investigation of this race, he found that these people had also inhabited parts of France and Great Britain, and that their residence was associated with the erection of rough stone monuments (megaliths), of which Stonehenge is a type. A series of slides showed examples of these dolmens from Europe and also from India. It was in 1911, when he was examining for the Natural Science Tripos at Cambridge, that Professor Smith made a further astonishing discovery. A skull had been put out for purposes of examination, and he was interested to find that this was a perfect example of the race into whose customs and travel he had been inquiring. To his amazement this skull proved to have come from the Chatham Islands in the Antipodes, and to be only one of a collection of skulls all bearing the same characteristics. This encouraged him to look still further afield for signs of this people. In 1914 he was in Australia, and there found a mummy brought from the Torres Strait which was embalmed in a peculiar way. The method was so characteristic of that employed by this special race in Egypt that it might be taken as conclusive evidence of the spread of their particular culture. Moreover, it is found in all parts of the world associated with the megalithic monuments. Many other customs and beliefs were found to be characteristic of these peoples, and assisted in locating with certainty those parts of the earth which they had inhabited. Amongst the customs cited were those of piercing the ears for the support of special ornaments, tatooing, and the use of the swastika, and the fairly prevalent custom amongst certain races of "couvade."

The Coincident Distribution of Gold.

In 1915 Mr. W. J. Perry, having received from Professor Smith an account of his researches, drew the latter's attention to the remarkable fact that wherever this early race of explorers had left the traces of their culture, there might also be found evidences of a natural deposit of gold. Certainly there were some corners of the map where gold deposits had been marked, but no megalithic monuments reported. In some of these an investigation revealed unmistakable evidence, of the residence of this people—monuments and also the characteristic terraced cultivation of the river banks. In other places, as in the goldfields of the Transvaal and in Australia where gold was abundant, the marks of the explorers were wanting. Numerous maps were shown proving the remarkable close coincidence between the gold deposits and the megalithic remains. Some of these maps were constructed from observations made by independent observers before Mr. Perry had advanced his theory relating the two sets of observations. Some idea of how the explorers travelled was obtained from drawings of boats found on bronze relics in Sweden and in the sculpture of the Egyptian megalithic days. This type of ship was also found by Stanley on Lake Victoria Nyanza.

The earliest historical records (the Vedas) refer to man as living in territories which have also been located as the sites of goldfields. Mithras worship is also found to follow the same geographical plan. A modern map shows in its outlines the same relation of occupation to mineral deposit. Thus the Russian boundary is drawn to include the valuable mines to the north of Persia, while the Franco-Prussian War and the war just concluded illustrate further the tendency of the dominant race to include minerals within the limits of their territory.

[1] A report of Lectures I. and II. appeared in THE LANCET of Feb. 7th, p. 357.

The Paths of Discovery.

The connexion between gold and early civilisation, as already shown in Europe, Asia, and Australasia, was also demonstrated in the American continent. An outline was given of the direction in which these explorations after gold had spread. About 2500 B.C. the valleys between Turkestan and Persia had been exploited. Jade was found in the river-beds, as well as gold and pearls. Though the explorers attached no particular value to jade, the local inhabitants endowed it with the same magical properties as the gold and pearls. Influences of Babylonian culture were again evidenced in the banks of these streams. The early discoverers would have pressed on to N. China and there separated into two parties, one passing on to the valley of the Yenisei in Siberia to found there a colony of marauders that had proved a storm centre of the civilised world for 20 centuries. It was the pearl-beds that had lured the adventurers to the American side of the Pacific. Pearls were found on the islands in their track and the site of Copan, in Honduras, mentioned by Professor Smith on account of its precise evidence of old-world culture, was the one spot in that part of America where gold, silver, and copper were all to be found. The pioneers who went in search of gold had sometimes suffered from the reputation their wealth gave to them. They were attached by the ancient military aristocracies and enslaved, and so the evidences of their existence might sometimes be obscured.

How Gold Acquired its Charm.

An important and absorbing part of the story related how gold came to acquire so great an influence in the world. The earliest evidence of its use comes from Egypt and dates from about 4000 B.C. The ancient Egyptian symbol for gold is a conventional girdle of cowries. These shells still form part of the dress of certain tribes, and in the more recent Egyptian history were worn by princesses with gold and felspar to complete the girdle. The cowry shell was buried with the Egyptian dead. It was endowed in their belief with the virtue of vitality. It increased fertility, preserved youth, and was given to those who died in the belief that death was a sign of diminished rather than absent vitality, and that with this additional source of vigour the dead might carry on some sort of life beyond the grave. After a time the demand for cowries must have exceeded the supply for models were made in imitation of the real shells from the clay of the river bed. Then gold, also found in the river-beds, was used to make model cowries. The beauty and lustre must have confirmed their beliefs, till presently the substance rather than the form acquired a magical significance.

MEDICAL AFFAIRS IN JAIPUR STATE, 1918.

JAIPUR is an independent Rajput State, the capital of which, having the same name, is an important commercial centre; the population of the State in 1911 was 2,636,647, and of the capital, 137,098; the city lies about 150 miles to the south-west of Delhi. The climate is hot, but not unhealthy. The birth-rate in 1918 in Jaipur city was 20·2 per 1000, and the death-rate 72·97 per 1000; about one-third of this mortality occurred among children under 5 years of age.

The chief causes of death were fevers (5898), plague (1191), and respiratory diseases (820). The plague epidemic had completely subsided in the early part of June, but was severe while it lasted; there were 1199 attacks and 1196 deaths in Jaipur city and the plague camp hospital; and 18,150 attacks and 17,479 deaths in 331 infected towns and villages throughout the State. Influenza was also epidemic in a very severe form in October, and caused 4393 deaths; on Oct. 24th there were 265 deaths from this cause alone in Jaipur city. At the Mayo Hospital a total number of 29,240 patients were treated, of whom 2320 were in-patients. As many as 1032 major operations were performed, 963 of these being undertaken by Rai Bahadur Dr. Daljang Singh Khanka, including 471 for cataract. The number of prisoners in the central and district jails averaged 772, with an admission-rate to hospital of 182·6 and a death-rate of 49·21 per 1000; the admission-ratio is considerably lower than that for jails throughout India as a whole (706 per 1000, average 1906–15), but the death ratio is much higher (20·46 for India, 1906–15).

An interesting and valuable series of tables in the appendix give details of meteorological observations taken at the Jaipur Observatory. The mean temperature in 1918 was 77·4° F. (the same as the average for 50 years); in May the mean was 94·4° and in June 91·4°; the solar radiation thermometer registered 178° on May 15th, 174° on June 23rd, and 175° on July 5th; the highest shade temperature registered was 114° on May 15th. The total rainfall throughout the year was only 8·82 inches, compared with 51·86 inches in 1917, and a 50 years' average of 23·69 inches.

Jaipur is a flourishing and healthy State, hot in the summer and cold in the winter, but not nearly so extreme in either direction as Western Rajputana or the Punjab. The city is well built and its sanitation well cared for. The report under consideration, which is submitted by Dr. D. S. Khanka, assistant surgeon, is comprehensive and well arranged, and bears testimony to the enlightened administration of this independent Rajput State.

THE POSITION OF POTASH SUPPLIES.

THE future of potash supplies is of the utmost importance to the agricultural interests of this country and therefore to the community at large, and it is disturbing to find that our own resources, so far as they have been exploited, prove to be short of requirements. Perhaps a useful and valuable lesson might be learned from what Germany has done in this matter. That country found long ago in the famous district of Stassfurth that there were great deposits of common salt left probably by the evaporation over an infinite period of time of a great sea incursion. The same thing, likely enough, happened in these islands, for we possess huge deposits of salt in Cheshire (Droitwich and Nantwich in particular) and in Stafford. In Germany it was argued that as potash was also a constituent of sea-water its salts probably would be found beneath the common salt layer. Continued boring proved that to be the case, and a centre of the world's supply was established. What this supply means may be judged from the following paragraph taken from the *Economic Review* (Jan. 21st):—

Prospects of the German Potash Industry.

A report on the conditions of the potash industry during the war and its prospects, issued by Gebr. Dammann in Hanover, states that in 1913 2,483,000 d.ctr. of pure potash, to the value of over Mk. 100 mill., was exported to the United States out of a total sale of 11,100,000 d.ctr. This outlet was completely closed, but Germany's economic life was so strangled by the war that any danger of over-production disappeared. No new shafts were sunk during the war.

The geographical position of the Alsace deposit lays down definite limits for their future working. Germany's needs for agriculture and industry are undiminished, and she must also supply the enormous areas in the East; Northern Europe will scarcely enter into competition; the sales overseas, especially to the United States, will also fall principally to the German potash industry. Leading manufacturers are of opinion that under normal labour conditions the production can without difficulty be increased from the 11 mill. d.ctr. in 1913 to 20 mill. d.ctr., and the exploitation of the almost unlimited opportunities of sales abroad can contribute to the raising of the German exchange and the restoration of her economic life to a sound basis.

The average selling value of 1 d.ctr. of pure potash has increased from Mk.17.50 in 1913 to nearly Mk.29 in 1918—i.e., by about 70 per cent. The figures for 1919 are not yet to hand, but since the average home prices have increased during 1919 by a further 175 per cent., there will be a considerable increase in turnover to record in spite of the reduction in quantity, the sales probably reaching about Mk.500 mill.

During the autumn of 1919 the work of concentration has been going on. Out of 198 potash works more than 150 are now united into syndicates, and out of 40 new mines being opened 30 belong to similar concerns.

The fall of the exchange and the appearance of foreign buyers in the German share market has made itself increasingly felt in the potash industry.

As regards the future, the potash industry is especially adapted to aid in the reconstruction of Germany's economic life. It has no need to import raw material. The German deposits are so rich that without stinting home agriculture and industry they can supply all the civilised countries in the world. (*Hamb. Corr.*, Jan.6.e.)

Potash is clearly a magnificent asset to Germany, and the circumstances of the birth of the industry may well be worth enquiring into in regard to the great salt deposits in this country. Have our engineers, geologists, and chemists gone into this matter? The German view seems to have been that where there was sodium there must be potassium. It proved right. It seems to us we should start a similar quest in the depths of our great saline deposits. With any success both medicine and agriculture would profit.

A GLOUCESTERSHIRE CENTENARIAN.

Mr. Joseph Read, an inmate of the Thornbury Workhouse Infirmary, celebrated the 100th anniversary of his birthday on Jan. 28th. He was born at Winford, Somerset.

THE SOCIAL SERVICE LIBRARY.

Messrs. Bell will inaugurate next week the new "Social Service Library," which they are publishing in conjunction with the "Ratan Tata Foundation," under the editorship of of Mr. C. R. Attlee. The first volume deals with "The Social Worker," and is designed to some extent to serve as a general introduction to the series. Succeeding volumes will deal with "The Boy," "The Mother and the Infant," "The Girl," and "The Worker and the State." All of these are in active preparation and will, it is hoped, be published at short intervals.

CHILDREN AND CINEMAS.

THE question of injury said to be caused to children sitting too near the screen at picture theatres has been engaging the attention of the Eastbourne corporation, which invoked the assistance of Mr. N. Bishop Harman. In a report presented in conjunction with the medical officer of health of the borough, Dr. W. G. Willoughby, Mr. Harman says the optimum position is as nearly as possible in a line with the centre of the screen, and as far away from the screen as thrice its full height. In this position, and at such a distance, the picture appears more natural than in any other. But in nearly all the cinemas in Eastbourne Mr. Harman discovered the front seats were much too near the screen, the distance being equal to about once the height of the screen; and as children were often relegated to the front rows the pictures had an injurious effect on their eyesight. The corporation have decided to include a clause on the lines suggested by Mr. Harman on the issue of any new licence.

MEDICAL PENSIONS BOARDS.

To the Editor of THE LANCET.

SIR,—"Ex-R.A.M.C." in your issue of Feb. 7th pertinently inquires how practitioners with large panels can find time to officiate on so many medical pensions boards. The inquiry might with advantage be extended as to the method of appointment and qualifications of the hordes of medical officials who are engaged in the Pensions Ministry from Whitehall downwards and the necessity for their existence. Many of the pensioners have been out of the army for two or three years, or even more, and it is high time that permanent pensions should be awarded them instead of re-boarding them over and over again. Further, the assessment should be made in doubtful cases by those who have actually treated these men for weeks, or perhaps months, and who therefore can best estimate their disability. The waste of public money involved in maintaining the medical personnel in the various regional areas (many doing clerical work that could be carried out as efficiently and more economically by clerks), with the accompanying galaxy of clerks and typists, is appalling, and it would be interesting to know the proportion of administrative charges to the amount actually reaching the pensioners' pockets or expended on their treatment.

I venture to think that such a return would effectually check the efforts now being made to saddle the country with an enormous State Medical Service.

I am, Sir, yours faithfully,

Feb. 8th, 1920. PENSIONER.

To the Editor of THE LANCET.

SIR,—I quite agree with "Ex-R.A.M.C.," who writes in your issue of Feb. 7th that it is unfair that those of us who have lost our practices through joining up should have to compete with men who have not served in the war in any capacity. Some of us are on short time and employed for a very few sessions weekly to make room for these men. This is contrary to the many definite promises made by the Ministry of Pensions that preference would always be given to those who had served at home or abroad.

I am, Sir, yours faithfully,

Feb. 8th, 1920. ANOTHER EX-R.A.M.C.

LIQUID PARAFFIN AS AN INTESTINAL LUBRICANT.

To the Editor of THE LANCET.

SIR,—It would be of interest to know whether any ill-results have been observed in relation to the regular use of paraffin as an intestinal lubricant. If paraffin oil be taken at or near a meal-time one would expect that, the food being thus intimately mixed with an inert mineral oil, there might thus be interposed an obstacle to efficient digestion, ultimately leading to varying degrees of malnutrition and intestinal putrefaction, comparable with that which results from pancreatic insufficiency. As a corollary it would be of the first importance that liquid paraffin should only be taken late at night.—I am, Sir, yours faithfully,

Linden-gardens, W., Jan. 24th, 1920. PAUL C. GIBSON.

*** The admixture of a non-saponifiable oil with food is calculated to act as a barrier against the action of digestive (hydrolysing) fluids. Even saponifiable fats do this, as in a greasy meal. While petroleum lubricates the bowel it gives indigestion in some subjects.—ED. L.

METRIC DISPENSING.

To the Editor of THE LANCET.

SIR,—In reply to "W.," since the war many of us have got into the habit of excluding Germany from our consideration in most matters. German regulations do not commit other decimal-using countries to the same. The comma forms no part of the decimal system proper, be it money, weights, or measures, and its use in connexion with such only tends to complicate matters. The proper point is a full-stop reversed—i.e., upside down, so as to appear at the upper part of the figures. There is no necessity to denominate the fraction in any amount which is already denominated by its relation to the integer, thus 7 g 50 can mean nothing more nor less than 7 g 50 cg. The mode of expressing metric measures I advocate renders mistakes practically impossible.

I am, Sir, yours faithfully,

Coulson-street, S.W., Feb. 4th, 1920. W. W. HARDWICKE.